BULLETIN No. 9.

DEPARTMENT OF AGRICULTURE.

TWENTY-FIRST ANNUAL REPORT

OF THE

# Pennsylvania State Dairymen's Association,

FOR 1895.

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CLARENCE M. BUSCH,
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# REPORT

OF THE

# PENNSYLVANIA

# State Dairymen's Association.

# 1895.

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## LIST OF OFFICERS.

President.

H. C. CRAWFORD, Cooperstown, Pa.

Executive Committee.

First Vice President, JOHN C. McCLINTOCK, Meadville, Pa.
Second Vice President, GEORGE M. ORRIS, Meadville, Pa.
Third Vice President, J. B. PHELPS, Conneautville, Pa.

Secretary.

GEORGE H. ST. JOHN, Meadville, Pa.

Treasurer.

M. GLENN BEATTY, Meadville, Pa.

Vice Presidents.

Hon. J. C. Sibley, ..... Venango county.
M. L. Freeman, ..... Crawford county.
J. S. Kean, ..... Crawford county.
Leon C. Mazaw, ..... Crawford county.
Henry Port, ..... Erie county.
A. L. Wales, ..... Erie county.
A. Billings, ..... Erie county.

W. T. Everson, ..... Erie county.
H. S. James, ..... Venango county.
R. S. Hartley, ..... Warren county.
Col. T. S. Strohecker, ..... Venango county.
T. S. Forker, ..... Mercer county.
T. J. Millenger, ..... Lancaster county.
Thomas Magee, ..... Centre county.
William Darlington, ..... Chester county.
Joseph Dillingham, ..... Montgomery county.
J. M. Shields, ..... Jefferson county.
Prof. H. J. Waters, ..... Centre county.
J. B. Phelps, ..... Crawford county.
Charles Lott, ..... Warren county.
R. S. Cadwell, ..... Washington county.
Leonard Rhone, ..... Centre county.

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## CONSTITUTION OF THE

## PENNSYLVANIA STATE DAIRYMEN'S ASSOCIATION.

Adopted in 1871, amended in 1882.

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Section 1. This organization shall be known as the Pennsylvania State Dairymen's Association.

Section 2. Its purpose shall be to improve and develop the dairy resources of Pennsylvania.

Section 3. Its membership shall consist of such persons as shall pay into the treasury the requisite fees, and of honorary members. The fee for permanent membership shall be one dollar, and for annual membership, fifty cents.

Section 4. Its officers shall consist of a President, Secretary, Treasurer and twenty Vice Presidents.

Section 5. The Executive committee shall be composed of the President, Secretary and Treasurer, together with the first three Vice Presidents, and shall have the oversight of the affairs of the Association, the appointment of its meetings, and all arrangements for the same, including the annual meeting for the election of officers.

Section 6. It shall be the duty of the Secretary to keep and prepare for publication the transactions of all meetings of the Association each current year, embracing such papers as shall be approved by him. The Treasurer shall keep the charge of the funds of the Associa-

tion, and shall disburse the same on the order of the Secretary, countersigned by the President; and shall report receipts and disbursements at the annual meeting.

Section 7. Amendments to this constitution may be made at any annual meeting by a two thirds vote of the members present.

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## REMARKS.

The object of this Association is to furnish to dairymen and farmers the best and most effective means of co-operation in those things which cannot be done individually; namely, in the comparison of experiences and making note of those things which can be learned only by thorough trial.

The opportunity afforded in the annual meeting for a systematic comparison of experiences and thorough instruction from capable lecturers cannot be overestimated. In fact, the advantages of this Association to individual members may be partially summed up in the following:

1. A membership identifies the holder with the greatest industry in this country, making him a component part of an organization of the great body of farmers, who furnish to the nation the milk, butter and cheese which it consumes.

2. It brings the holder into direct contact with those influences which will not only instruct him, but stimulate his enthusiasm and energy in the work in which he is engaged, raising it above mere drudgery to a business not only profitable but pleasant to engage in.

3. The receipt every year of the State Agricultural Report, containing not only the proceedings of the Association, but of all the various branches of farming under the control of the Department of Agriculture. This volume is furnished free of charge, and a copy is preserved at the office of the Secretary for each member on the roll, and the same can be obtained at the annual meeting, or at any other convenient time.

4. Each member receives due notice of the meetings and work of the Association, giving each an opportunity to engage in the work and reap its benefits.

5. It makes him eligible to all prizes offered by the Association for exhibits of dairy products.

6. The cost of membership is so small, being $1.00 for a life membership, that this small fee can be regarded as only a token of mem-

bership and not a fee. No farmer engaged in any degree, in the dairy industry, and no manufacturer of dairy products, who seeks to know his business and make it profitable, can afford to neglect to identify himself with an institution so necessary to the mutual advantage of all engaged in this great industry.

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# TWENTY-FIRST ANNUAL SESSION OF THE PENNSYLVANIA STATE DAIRYMEN'S ASSOCIATION.

*Held in Library Hall, Meadville, Pa., February 6, 7, and 8, 1895.*

The gathering of members was somewhat tardy on account of the unusually severe weather outside, and the uncomfortable chilliness of the atmosphere within the hall. At 11.30 President H. C. Crawford called the meeting to order, and announced the following committees:

Resolutions.—J. B. Phelps, Hon. S. J. Logan, L. F. McLaughlin.

On Audit.—E. S. Crooker, George M. Orris.

Finance and Membership.—J. C. Whitehill, C. A. Stranahan, Benjamin Culp.

Intelligence.—C. W. Heydrick, R. S. Hartley, A. L. Wales.

Dairy Utensils and Butter.—John C. McClintock, D. H. Lefever, Archie Billings.

Nominations.—George M. Orris, J. B. Phelp, E. S. Crooker.

After which adjournment was taken until after dinner.

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## REPORT OF SECRETARY.

Mr. President and Members of the Association:

The duties devolving upon the secretary in compiling the report for the last session have been discharged to the best of our ability, and we congratulate the association on the fact that we are able to announce that the reports for 1894 are here to be distributed. This is the first instance in the history of the Association, in which our State Printer has been able to place the preceding year's report in

our hands in time for distribution at the annual meeting, and we think great credit is due him for his success in this respect. Credit is also due him for the excellent cuts of famous dairy stock belonging to members of the Association. This achievement marks a stage of decided progress and obviates the necessity of our annual resolutions on this subject. The reports for 1893 are also here for distribution.

Your executive committee has taken great pains to prepare a profitable programme, and secured lecturers fully abreast with dairy progress at this time, and a liberal number of local dairymen that fully understand every detail and requirement of the dairy industry in our midst, have been placed on the programme.

It should be remembered that, however carefully and wisely the plans for the meeting have been made, contingencies arise which modify results and even disappoint us seriously. Sometimes sickness of our best lecturers has interfered, sometimes flood, sometimes unusual weather, as in the present instance, but in spite of all untoward circumstances, it is hoped that this meeting may prove the most profitable in the history of the Association.

The butter exhibit of last year has stimulated our dairymen to renewed efforts in this direction, and anticipating this, your committee has decided to offer a series of cash premiums sufficient to induce competition, but not large enough to be a serious drain upon the finances of the Association. The usual number of entries have been made, and the usual interest is manifested in the results.

The exhibit of dairy utensils last year was a creditable one, and elicited great interest on the part of members. The entries for this year are few, but what we have embrace some of the best dairy machinery in use.

The finances of the Association have not been in such condition as your committee desired, and we have been obliged to make a limited appropriation for this meeting, but through judicious economy we shall again have a surplus in the treasury for next year's meeting.

Our membership was increased with the addition of twenty-four names last year, and the prospects for additions to our numbers are flattering for this year.

There has been received by the secretary and paid to the treasurer for memberships, $24.00; for butter sold, $4.50; for State appropriation, $350.00. The amount of orders drawn on the treasurer exceeded this amount by $37.92, but the economy practiced this year will not only meet our arrearages, but leave not less than $75.00 in the treasury.

All of which is respectfully submitted.

G. H. ST. JOHN,
Secretary.

## PRESIDENT'S ADDRESS.

Ladies and Gentlemen:

Once more we have come together in this, the Twenty-first annual meeting of the Pennsylvania State Dairymen's Association, and it once more becomes the duty of a new presiding officer to make a few remarks.

Permit me to thank you, one and all, for the honor you have conferred upon me in requesting that I preside over your meeting. I assure you I shall endeavor to perform the duties that will devolve upon me, to the best of my ability; ever keeping in mind the best interests of that great industry which this association represents.

We have come forth from our several homes in the belief, that aside from the pleasure of the social intercourse one with another, that each of us will carry home some thought, some experience, that, while it may not be new, yet it will serve the purpose of stimulating us to put forth better efforts, so that we may obtain greater returns from our calling in the future. The man who never improves himself or any part of his work or business, simply exists; he does not live, and has but little enjoyment in his existence beyond the mere animal satisfaction of living.

We look in vain among the many business associations for a gathering such as ours. Our object is to more quickly disseminate any knowledge or device that we may have secured during the interim of our annual meetings; and any improvement in machinery or agricultural practice here becomes the property of all.

Compare this with the way one manufacturer treats another if he has secured any device that is beneficial to him in his business, and his brother in the same business does not possess it.

I was once in a certain city and was desirous of looking through a manufacturing establishment. I had to almost declare I was a missionary lately returned from the Fiji Islands before I was permitted to enter.

I do not know of any way in which we can derive as much benefit in our individual capacities as we can in a meeting like this; where we can have the knowledge, the science and the inventive genius of the entire country spread before us; and can here question the investigator on any point that is not made clear. Here we renew our acquaintances, and meet the younger men who are soon to become the motive power of this great country.

Here, also, we have a chance to discuss those questions that relate to what we shall eat; what we shall drink, and how we shall secure the wherewithal to pay our taxes and buy our clothing.

The central thought of the meeting at this time is the development of our dairy interests. That there is enough to do to occupy the entire time of this convention no one will doubt.

It is now more than a score of years since this Association was first organized—almost the active portion of a man's life. It may have met when the Star of Hope shone out more brightly than it does at present; and no doubt has met when it was better guided in its deliberations than at present, but I do not think there ever was a time in its history when there was more need of the benefits that are to be derived from the instructors who will come before us, or more demand for the united action of all good citizens against the frauds of the present day.

When we read from the market reports of Bowen & Son, of Philadelphia, that they are paying twenty-four cents a pound for Pennsylvania Extra Creamery prints, and only thirteen cents and fourteen cents for Pennsylvania Extra ladle worked butter, it is enough to make a man think that more people ought to take the Short Course at the Pennsylvania Dairymen's Association.

The necessities of the hour not only demand that if the American farmer is to keep up with the procession that he must use his best thought, but that he must be guided in his work by the best skill; that this product must meet the products of other industries on an equal footing if they are to compete in the markets of the world with the products of the people of a lower civilization than ours, who are now being armed with our best machinery.

The ingenuity of man has produced many strange products, some of which threaten to destroy the dairy business, and others that threaten to destroy the dairyman.

The business of food adulteration has become so extensive, and its results so far-reaching, that it demands our most earnest and thoughtful consideration. It is not only blighting the business of agriculture, but it is sapping the foundation of our health and thwarting the skill of our physicians.

The reports of every commission that several of the states have appointed, all show that almost all articles of food and drug are adulterated to an alarming extent.

A nation's homes are its best fortresses. It therefore becomes the duty of a nation to see that the food offered for sale is pure and wholesome; that we may build up a strong, vigorous manhood.

During the last year the manufacturers of oleomargarine paid a tax on a trifle less than seventy million pounds. They also swear before the authorities that it costs about six cents a pound to make this mixture of tallow and cotton seed oil. Now, if they sell this mixture for only twelve cents a pound (and they sell it for more) we find they filch four million, two hundred thousand dollars, annually,

from the pockets of the American working man, for whom they have so much concern, beside selling him a counterfeit of a product which a man may imitate, but only the most delicate nervous structure can produce.

I think it is not only the duty of this Association to teach the best methods of dairying, but to take the lead in securing the most stringent laws against the making and selling of impure food.

To this end I would recommend the appointment of a legislative committee, whose duty it shall be to represent this Association in all matters of this kind where legislation is needed.

On several occasions this Association has asked for a larger appropriation, and as often it has been refused. Its officers have given their time, and often of their means, for its support. For the good it has accomplished I would refer you to its proceedings as published in the Agricultural Report, and the many prominent dairymen in northwestern Pennsylvania. Our last president carried off the honors of the State for the best butter at the World's Fair; another has become noted as an expert feeder, and member of the State Board of Agriculture; and still another, the Patrick Henry of the day, who now represents you in Congress, whose reputation as a statesman and dairyman, though it now extends from shore to shore, will yet shine with increasing lustre.

The dairy interests of this State are great, and yet this Association receives but three hundred and fifty dollars annually, for its support; while the appropriating, by the present Legislature of Pennsylvania of one hundred thousand dollars for a second edition of a bird book, the former edition of which went to develop the aesthetic tastes of our sportsmen, is considered a matter of small importance.

Is this right? Is this just? Is it not contemptible? I will not attempt to enumerate the many ways the funds of this State are squandered. Moreover, it might first be well to cut off some of the wastes that occur in the agricultural part of this procession. I will mention but one.

We have an organization in this State known as the Pennsylvania Agricultural Society, which has an annual allowance of two thousand dollars. The object of this society is to use up this money in the salaries and other expenses of the officers, and to hold a State fair in some portion of the State. Those of you who are not familiar with its practical workings, as shown by their fair held in this city last fall, I would refer you to their own statements of their proceedings in the Agricultural Reports. Their proceedings, as published, with scarcely an exception, are about as valuable to the cause of agriculture as last year's weather bulletin. Their fairs are a disgrace to the State, and are demoralizing to agricultural exhibitions wherever they have been held.

We have the assurance that men of national reputation will be present at this meeting; but it is for you, ladies and gentlemen, to make this a profitable meeting.

As the honor you have conferred upon me was unsolicited, not being present, I think it is your duty to give your assistance, that we may make this meeting as profitable as its predecessors.

Again, I thank you.

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## MANAGEMENT OF THE CORN CROP.

Mr. J. B. Phelps, Conneautville, Pa.

Mr. Chairman, Ladies and Gentlemen: As I have always been used to working at the corn crop in a milder atmosphere than that which surrounds us today; and as the corn will not grow in cold weather, I do not apprehend that I will get you much enthused on corn raising. I am not going to make a speech; I am going to give you a talk, just a simple, farmer's talk. I am not going to display any eloquence, because I have tried it, and it is a failure. Just consider yourselves in my barnyard, asking me some questions about corn, and the management of the corn crop, and I will try to talk to you.

Now, it has been said that corn is king; and the Western farmers concluded that corn was king, after raising hundreds of acres of it. The Eastern farmers say grass is king; but in my opinion, Pennsylvania and the Eastern states, to a large measure, and especially the Middle and Western states, will find that corn is king. Corn, in my opinion, is the cheapest crop a man can raise in this country, if he is engaged in agriculture. It is a crop that does not exhaust the soil. This is on account of the large leaves taking the nitrogen from the air, to a large extent. It is composed largely of carbohydrates, thus furnishing cheap food in the line of carbohydrates, and we must have it. If we had a larger amount of carbohydrates within us to-day, we could stand the cold better than we do.

It is that part of the food that is the largest part of the ration for our dairy animals. Carbohydrates is one of the necessary ingredients of their food. They are the heat formers in the animal system. A

rightly balanced ration averages five to seven parts of carbohydrates to one of albuminoids; and thus we see that a large part of our food must be of that kind of matter.

I am only going to speak briefly. You will be ready with lots of questions. I am going to explain to you the management of the corn crop all the way through.

In the first place, when you contemplate planting your corn it is necessary for you to get the ground well fitted. I suppose you all know how that is done. It is not necessary to tell the best way of planting. You all know how to fit your corn ground to the best advantage in the spring. I will give you a few pointers in regard to that. First: Plant on sod if you can. You cannot get your ground too rich for corn. Second: Don't plow too deep for corn in this county. You don't want much subsoil the first year, at least. If I had lots of barnyard fertilizer, I would put it on and plow it under. I would rather spring plow than fall plow; but probably for the corn crop there would not be a great deal of difference. Plow it early and harrow thoroughly before planting. Get it pulverized. Before you do this, though, you want to get your seed. Be sure and get the right kind of seed, for there is a great difference in seed. Don't think that because you get a seed that will grow that it is all right. Get strong seed. Get seed that grew the year before. I wouldn't take old seed; that is, two years old. It may grow, but it has not the vitality that young seed has. The older it is the less vitality it has. I want as fresh seed as I can get, and I want seed that will stand the wet weather. If the seed is good, and strong in vitality, it will overcome this and come out all right; consequently it is necessary to get good seed. The time of hoeing is past and gone; the hoe is nearly behind the age.

In giving this talk I am compelled to use the personal pronoun "I" pretty often; but don't call me egotistical; I am only giving my own ideas and experience.

Now, as to the planting of corn. What comes first? The first thing is, how to plant. I use a one-horse drill. I have used, years before, a grain drill; planted two rows at once, but I have abandoned that. There are several reasons for it. I can get it in better shape now, and that is worth considerable. Try and get your corn planted right if it does take a little more time, because here is the starting point for a good crop. In order to do the best work a corn-marker is a necessity; and I will tell you how to make one with little expense of time or money.

To make a corn-marker I take 3x4 scantling, and chamfer one side the longest way, so as to make a runner of it. Lay it down edgewise the widest way up, and take a plank about 15 inches wide. This

does not need to be over 10 feet long. I mark out my corn rows to $3\frac{1}{2}$ feet apart. Lay these runners down, four of them, three and one-half feet apart, and you mark four rows. Spike these planks right on to these runners and turn it up edgewise; then take a saw and saw off just outside the two inside runners, so the beveling will be on the inside. This gives it an advantage in working up and down. Now put in the tongue; and you can do that very cheaply. Put it in so that it works up and down a good deal like the tongue in a skipper boat. Now, on these two wings bolt some good hinges, (strap hinges), largest size. Bolt them on strong, two on a side, and then you will have to drive a couple of staples to the end of these wings, and have a rod as long as the width of the row, following the mark. When you get to the end take it out and change it to the other side. In coming to a dead furrow it is necessary, to come right, to run one runner in another mark. Go three or four times back and forth until you get the rows straight, perfectly straight; and this leaves a mark all over the field three inches wide. It crushes the lumps, and makes a mark all along through. When you come to drill with the corn drill the share is very sharp, and it goes right in the center all through; and then again, the horse will follow right in that mark after he has gone through two or three times. You don't have to mind the horse at all.

After three or four days, or not to exceed five days, start your common harrow and drag it thoroughly. After the corn sprouts harrow it again. Do not use a spring tooth harrow; or if you do, set it so it will not interfere with the corn. Do not use any harrow that will tear up the corn. A smoothing harrow is good, if it doesn't stir the corn. I drop not to exceed two inches; using six to eight quarts, sometimes ten quarts. You should not disturb the corn. Harrow it down, and do that before the corn sprouts very much. When the corn gets up about an inch long you had better let it be until it gets two leaves on it; then it becomes tough and you can work it. When it first comes up it is very tender. When you harrow again, harrow it cross-wise, and length-wise if you want to. Don't be afraid to harrow. If the corn lays on the top of the ground all pulled up, both root and branch, don't feel scared. You can afford to lose a little seed corn in order to get the rows cleaned out. The greatest trouble is right in the row where the corn is. Some people have discarded the drilling system and plant in hills so they can harrow both ways. The weeds must be exterminated if you have to stir it to the very center. If you have a Breed's Weeder, after the corn gets up two or three inches high, you can work the weeder right along. You don't want to disturb it if the ground is wet. When the corn is six inches high you can go through with the cultivator. If you have a two-horse cultivator it will work. I have one that cost $30 and have

used it just about once in a year on my corn crop. I use, generally, a little one-horse cultivator. Use the Ajax, Planet Jr., Little Giant —they are all good. Use a two-horse cultivator when the corn is six inches high, if you want to. Don't go very close to the row. When you get to cultivating let the teeth down quite deep. This is the last deep cultivating that you want to do.

When you get through with the two-horse cultivator, the next cultivator that I should use is the one-horse cultivator with a small attachment hitched to it. This is a plan of our friend Gould. It works so simply and easily, and so successfully, that I consider it a great improvement. Sometimes these little devices are very essential. If you have a one-horse cultivator just take off the hind tooth; the one that runs away behind. Take that off entirely and put it over in front. There are holes in the middle piece of the cultivator. You will find it in all of them. Take this off and put it in the center. Take an inch-and-a-quarter stick of hard wood, something strong. If your rows are three and one-half feet apart, cut it off about 30 inches long, and bore a couple of holes, one about three inches from each end. You can adjust the legs to suit the stick. Take the same bolts that go through the teeth on the two outside legs, and put on the bar, and the thing is fixed. Now I am going to cultivate. You can completely hoe your corn with that stick. It leaves your ground level. When you get through and look at it you will be pleased to see how nice it looks.

Corn wants a level culture more than anything else. It is a sun-plant; grows close to the surface. In going twice in the rows you bear down a little mite on one side to throw the dirt down around the roots a little. Go twice in a row and you have it fixed; when you get through, your corn field is level. It leaves it in very fine shape for growing. Follow this up as long as you wish; and after the corn gets up you will have to go to hoeing. Now, take off your stick, and take an old wagon tire if you can find one; straighten it up and cut it off 30 inches. Let the blacksmith cut some holes in each end. Have him level off one side of this stick, and hammer this down to a bevel on one side. Take this and put it on the grindstone and grind it down pretty nearly sharp. It will do the work all right. Hold it on behind with the flat side in front, and the bevel on the back side, and if it is not adjusted just right you can soon put a wedge on there, and then go on and cultivate just as I have been telling you. It shaves the weeds right off under the surface, and the next day they will all be dead. This loosens the ground and gives it a fine mulch on top. I have done this when the crop was just up. When the corn is in tassel I have taken a horse and put a muzzle on him and cultivated the corn when it was so tall that you could not see the horse after he started in.

In regard to the kind of corn to plant. If you want it for seed or for the silo I would take a large variety. I would grow the largest variety that would mature. I use the Leaming corn. The Leaming corn which was raised in our vicinity some fifteen years ago, did not mature quickly enough; the frost caught it. Now I use the Leaming corn; and with our management and this kind of cultivation, it matures readily, and ripens two weeks earlier than the old way. The idea of plowing out corn is one of the back numbers.

Q. Do you plant your ensilage corn as early as you can?

A. Just as early as the ground is warm. There is a difference between the ground being dry and the ground being warm. If it is cold let it be until it is warm. Wait until the ground is ready to receive the seed. I have planted Leaming corn on the 16th of June, and it ripened before the frost came. I laid the ripening to the cultivation. In cultivating do not disturb the corn. The more you tear its roots the more you cripple the corn, and the more you throw it back. This level cultivation is one of the best ways to stimulate the growth of corn. It ripens earlier. Now, after we get through, harvest is over—that is, our small grains, we have a little leisure, and we sharpen up our hoes and exterminate every weed. You don't want a weed in the field when you go to harvest your corn in the fall. Take a file and file your hoes down sharp. You will wear out a hoe after a while, but a hoe only costs thirty-five cents. Now, go through and cut off every weed close to the ground. There will be no more weeds after that. The shade of the corn will prevent the growth of any more weeds.

Now, we are ready to harvest. I suppose every man here is a dairyman. If you have a large variety of corn, I would advise to not let it stand as long as the smaller varieties. In planting the Leaming corn you will find that if you plant about a peck to the acre that after you get through with the cultivation and management that it will stand about right. I plant thicker than I used to. I would not have the larger varieties farther apart than eight inches.

Mr. John Fox. In planting with one horse, do you use any fertilizer?

A. No; all the plant food about the cow stable we take out on the farm.

Mr. T. J. Brush. In going through the corn the last time do you sow rye and turnip seed, or anything of that kind?

A. I have not done it, but I am going to do it. I am going to sow crimson clover as a fertilizer next year.

Q. How often do you go through the corn with a cultivator?

A. I would go through it every week if the weather were suitable and I had the time.

Q. When you get through working the corn, do you have the field perfectly free from weeds?

A. Oh, there may be a few weeds scattered here and there, but it is practically clean.

Q. What time will you sow this clover?

A. The last time of cultivation; about the time the tassels are coming out.

Q. Do you sow that clover with the expectation that you will plow that ground the next spring?

A. Yes; I will sow it in the latter part of July or August. Now another word about the manner of cultivation. If you cultivate without the teeth on, you bury some of it. With this iron on behind, it doesn't cover it deep; it leaves the seed in nice shape. I have the teeth in front, not behind.

Q. Don't you cut the roots of the corn?

A. No sir; I put the iron on in front and the harrow behind.

Q. Do you mark your ground south when you can?

A. I used to say "north and south," but I have found that it doesn't make much difference. I find that the sun rises in the northeast and sets in the south west, but it gets there all the same.

Q. Do you plant in the moon?

A. No; I plant in the ground. (Laughter.)

Q. Wouldn't you advise, then, to plant across the field if the field is slanting to the west? I have seen it planted the other way, and wagon loads of dirt were washed down.

A. I have only given you some pointers; you will have to judge for yourselves about many of these things. A man who runs a dairy today and does not use brain power is going to get left.

Now, what are we going to do with the corn after it is raised? Will we keep on in the old way—take it up and put it in small shocks and put it on the wagon and draw it to the barn, and let about one-third of the shock be exposed to the weather for three weeks; and then take it to the barn and husk it and put the corn in the crib and the cornstalks over the barn floor; and then when you want some, go and throw the fodder down to the cows, and then take your corn and go to mill and lose from one-tenth to one-third; and then finally you have it in shape so you can feed it to the cows. Let us not do it that way. Take the corn up and cut it. Go and build a silo. I don't ask you to believe in this plan; I am only telling you my plan of doing it; you may do some other way if you want to. Now, we will have a silo built. We will cut that corn about a week before the usual time, and just take it up and lay it in gavels. You can lay two acres in gavels in a day. Now, let the wagon come along and take it up. I know some of these men will never put up a silo in the world; they are so prejudiced against this thing. But you get your silo made, and get a

low-down wagon, take the corn up in armsful and lay it on the rack. When you get it on the wagon take it right and put it into the silo. The corn is all there; the stalks are all there; all in digestible form for the cows. There is no husking the corn; there is no carrying it to mill and putting part of it in the toll. You have no one to watch to keep them from stealing your corn, for it is all in the silo; no rats and mice working at it. Now, you see you have the food, and the cattle will eat it all up clean, every particle of it. There may three or four per cent. of it that is not exactly fit to feed to cows, but two per cent. of this may be fed to the young stock, and they will do well on it. Don't feed this part to the cows that are in milk. When you have your ensilage prepared use it with your other foods, and you have just exactly what the cow wants.

Q. How long do you cut it?

A. I cut it six inches. Last fall in my section some people cut the corn stalks after they were husked, and made a kind of amateur silo. They haven't got there yet; they will soon get a silo.

I have spoken of the different ways of managing this crop, and I think we are now ready to cover it. Take two or three loads of wheat straw and spread it out and let it get rained on thoroughly. If it is about half rotten, all the better; then spread that right on top about eight inches deep; and the steam coming through it will rot it completely.

Mr. B. Culp. Did I understand you to say that corn was the most profitable crop the farmers could raise?

A. Yes, it is, for anything I know to the contrary.

Mr. Culp. I would object to that. It is not the most profitable crop.

Mr. Phelps. What is the most profitable crop?

Mr. Culp. Grass.

A Member. You made a statement in the first place that corn is not very hard on the soil; afterwards you stated that you must have your ground very rich. I can get as much benefit from ten loads of manure spread broadcast on my meadows as I can get from twenty-five loads turned under to raise a crop of corn. I consider corn one of the most voracious crops we have. Let a man go to raising corn and I think he will find it a very expensive crop.

Mr. Phelps. In regard to that, if you will grow a crop of flax and cotton you will find that it takes much of this nitrogen from the soil. Take cotton seed meal and you will find it is half nitrogen. That exhausts the soil; while the wide leaves of the corn take the nitrogen from the air. Corn is a hard drinker. It is composed almost wholly of carbohydrates. Now we understand that there is a large growth here. I have several lots or fields that produced a large

growth of pig-weed. I don't suppose that exhausted the soil very much. There is one point with the corn crop—it produces a large amount of fodder, and that fodder goes back as manure. It is like the man's story of the hogs—it produces more corn to feed to the hogs to make more manure to produce more corn to feed to the hogs to make more manure to produce more corn to feed to the hogs to make more manure, etc.

Q. I have a silo, and it is a question with me whether the man that cuts up all his corn and puts it in the silo, gets as much benefit from it as the man that husks his corn, cuts up his stalks, wets them and puts them in the silo where he saves everything, and has his corn ground and feeds a ration of meal, and knows just what he is feeding.

E. S. Crooker. There are no two acres in a field that will raise the same amount of corn. One acre will raise more than another. I don't think a man is as certain of what he is feeding as though he feeds his corn separate.

Mr. Phelps. If the corn is moved as fast as it goes into the silo then you get it thoroughly mixed.

Mr. Crooker. If your corn is uniform you will, but suppose you have an acre of corn that is not as well eared as another acre in your field, you certainly do not have as much corn there as you have where there is a heavy yield.

Mr. Phelps. This is just like everything else; you should have a little brains mixed with your management. You can tell by the way your animals are feeding. Now, if you find out that you are down to where there is not much corn, you will have to add something else to the ration. I have had to go this year and buy corn meal to supplement my corn. I planted eleven and one-half acres to the Leaming corn, and I have planted the balance to the large Southern White. It fired and didn't ear. I put the Leaming in the bottom of the pit, and have the poor silage at the top. Then I discovered that I was not feeding the right kind of a ration, and I had to go and buy corn meal and feed it to my cows until I got down to where the corn was.

Mr. Crooker. Suppose a man has a silo and is lacking in brains, wouldn't it be better for him to husk his corn and feed it that way? (Laughter.)

A. If he is lacking in brains he had better quit farming. A man cannot dairy successfully unless he has a lavish amount of brains. (Laughter.)

Mr. John McClintock. What is the difference between a ton of silage and a ton of well cured fodder?

A. The fodder lacks the carbohydrates. It is not necessary to

husk your corn and put it in the cribs when you can put it direct into the silo.

Mr. McClintock. Is there any deterioration in the silage after it is put into the silo? That is what chemistry teaches.

A. Chemistry will tell you one thing and practice results in another thing. Chemistry will tell you that swamp muck is almost the same in composition as clover hay, and yet I find that my cows prefer the clover hay. Chemists will tell you that the venom of the rattlesnake is the same as the white of an egg, and yet one is a very nutritive substance and the other is a deadly poison. No, silage does not deteriorate. If you want to cut corn fodder for feed don't go and put it in small shocks. Take a jack and make it in heighth in proportion to the corn. If it is large corn build the jack high. If it is very high nail on some pieces for a ladder. Then set up the corn around it until you get a large shock. Pull out the stakes and draw it out, and fill around that corn until it is ten feet across the bottom, and tie it around the top with binder twine; bind it right around the top. Then you will have some nice corn fodder. I feed that while the ensilage is curing in the silo. I have fed my cows grain in the fall, and then went right into the silo and have them increase the flow of milk. The silage is merely cooked and all ready.

Mr. T. J. Brush. How long does it take silage to cure?

A. Two or three weeks; and you can feed it all the year around if you want to. People have told me that they have kept it for several years.

Q. Would it not pay to plow up all the pastures and sow ensilage?

A. You may if you wish to.

Mr. Fox. After the ensilage ferments doesn't it taint the milk a little?

A. No, sir. What I am after is results. I will feed my cows sawdust if I can get the most profit from it.

Q. Is there not some danger of the ensilage freezing in the silo?

A. If you have a loose silo it will probably freeze at the top.

A Member. It affects the milk if it is frozen.

Mr. Phelps. I have an old silo with an eighteen inch wall, and in cold weather it froze six inches. I wouldn't want to feed that kind of ensilage to my cows, but I fed it to my young stock. It wasn't exactly right for my cows. That steam that arises keeps it warm.

Q. You say that you have a man that will cut two acres of ensilage in a day?

A. I have.

Q. How many acres will he cultivate in a day?

A. Just as much as the horse can cultivate in a day.

Q. Can they cultivate twice as much with a double cultivator?

A. Yes, but not as well. We must leave the ground in proper shape.

Mr. Culp. You don't attend to your corn all summer, do you?

A. No, not all the time. One trouble with our dairymen is that they will not adopt new ideas. The matter of fertilizers came up at the meeting of the State Board of Agriculture at Harrisburg. The question came up in regard to the different brands of fertilizers in use, and there were some chemists there, educated men, who claimed that there was some fertility in certain kinds of rock. After this I am going to break the little stones on my farm every year. I am going to hammer those stones to pieces about a couple of inches square. I have no boulders at all in my fields.

Q. Does your corn planter plant more than one row at a time?

A. One row.

Q. What size of a box or building do you have for your twenty acres of corn?

A. The size of our silo is 16x32 feet long and 16 feet high. We can fill that with twelve acres; but last year our corn was not so large, and then the large corn we had was not more than one-third of a crop on account of the drouth. We had a very extensive dry season with us. I have cut the silo in two or three times. I like that plan very well.

Q. Do you pack the ensilage as you put it in the silo?

A. Yes, especially the corners. The silo men have absorbed some new ideas about it. If I were to build another silo I would build it in another form. They are building them in octagonal shape, and I consider that a very fine plan. It is a good idea to make two silos.

Q. Do you have the body of your silo air-tight?

A. Yes, sir. After putting in your ensilage you should be very careful about packing it. In putting the ensilage in the silo I should be very careful to keep the outside a little higher and tramp the corners, on account of the friction on the sides. Tramp it as tightly as you can all the way up, keeping the outside a little higher, and at the last I should reverse that order and keep the center higher. If I were going to build another silo I should build it two or three inches larger at the top than at the bottom.

Q. Do you think it good to have it thirty feet deep?

A. The deeper the better. Forty feet would be better than thirty feet. I wouldn't build it less than sixteen feet deep.

Q. Is it necessary when you uncover part of it to take off that part every day?

A. Certainly; keep it as fresh as you can.

Mr. Culp. From your remarks I would judge that you would recommend the farmers of Crawford county to raise corn for profit?

A. I do not recommend corn alone. I rotate three crops. Plant corn on clover sod, with what fertility you can get from the barn-yard on that sod; cultivate as I have told you; put it in the silo; plow about an inch deeper the next year, and that throws all that fertilizer on top. That gives a first class seed bed. I sow about seven-eighths clover, medium, and about one-eighth timothy seed. I do not care for the timothy so much, but I think it holds the clover. It makes a finer soil for growing purposes. I recommend a little Alsike sprinkled in. The second crop is oats. Seed down to clover; grow one crop of clover and then draw out the fertilizer, and rotate in just that way. A year ago I got seventy loads on twenty acres of ground. I fed it to my cows. I don't know any better way than to feed concentrated foods.

Q. Would you not rather plant just the exact amount of corn you want to grow than to plant some extra, as you spoke of?

A. No. By planting a little extra seed, and doing the work as I do, I would rather lose the seed and facilitate my work. I cannot spend my time in tearing out weeds.

Mr. D. H. Lefever. I raised fifteen acres of corn last year, and I will guarantee you that you could pick up on a wheel-barrow all the weeds that were there, and I never harrow my corn, for the reason that there is so much fibre in the ground that I could not do it.

I use a double cultivator. I have a mulch there that I have to go through every time after a shower, and I cannot do it with one horse.

Q. Do you cut the corn and put it in gavels?

Mr. Lefever. No.

Mr. Phelps. Well, that is the trouble.

Mr. Culp. You said a man could pick up the bundles and load in ten minutes?

Mr. Phelps. I will make it six or eight.

Mr. Culp. Well, then, I wouldn't want to be there.

Mr. Phelps. We wouldn't want you there. (Laughter.)

Mr. Culp. Will you give me permission to tell what I think is the best crop?

Mr. Phelps. Certainly.

A. Well, I think grass is the most profitable crop we can raise.

Mr. Fox. Do you have a different way of manufacturing fertilizers?

Mr. Phelps. No; but we have a different way of saving it. Mr. Fox wants an intelligent answer. He wants to know in regard to saving the fertilizer. We save it carefully, and haul it out on the fields every week or ten days. By feeding certain kinds of highly nitrogenous foods we have a higher nitrogenous fertilizer.

Mr. Fox. That is what I wanted to get at.

Mr. Phelps. The trouble is that people do not save what they get.

Q. Do you use land plaster in the stable?

A. No, sir; but I would recommend it.

Mr. Lefever. This talk has been most interesting and instructive. He could hardly have stated the matter more plainly. We have been cultivating corn for years. Our soil is not clay; it is rich soil. His method of planting and cultivating, and finishing up with the silo is very nearly the same as ours. There is this about raising corn—you must have your ground in excellent condition. You must begin with the plow. You must plow right and harrow right; you must not have lumps and sods, or when you come to use the hoe you will find that it won't work well. You have to begin away back; you have to use brains. You have to be very particular from the start; then this system will work nicely. We don't try to harrow much crosswise; we harrow lengthwise. After the corn is up we use the weeder and light harrow. We differ from him in this—that we do not plant only about what we want to grow, five to six quarts. We don't intend to plow it much. For the silo we use mostly six or eight inches of large corn. We prefer to cut the corn for the silo a good length because we think it keeps better and cures better when cut in that way. So far as the feeding is concerned, like Mr. Phelps, I don't know much about chemistry, but I do know what the cattle say. They like it, and eat it all up clean. Taking that as good evidence in the matter, it is an excellent food. The use of the silo is, to my way of thinking, the most excellent way.

Mr. Crooker. Mr. Lefever says he can never harrow the corn on his land. Perhaps he feels a good deal as I did when I first commenced to use the harrow. Five years ago I was here at the meeting of the Association, and Mr. Smith, of Wisconsin, was here, and he told us something about harrowing corn. It was the first I had heard of it. Mr. Huidekoper says he uses a peg tooth harrow to harrow his corn. When I went home I made up my mind that I was going to cultivate my corn that way. I put in my corn, and when I went to harrow as Mr. Phelps states he does, I would drive a little distance and look at my corn, and I thought I was spoiling it. Then I thought I would try again. I was almost tempted to put my team out. I thought then if I could cultivate my corn that way it would mean a great saving of time to me, and so I went on and harrowed my corn. I think if Lefever would try it he would never try any other way. Perhaps I never have had as good success as Phelps has had, but I find that six quarts of corn will sow thick enough. But when you first begin to cultivate you will think that you are going to tear your corn all to pieces.

Mr. Brush. To say "six quarts of corn," does not enlighten some

of us. Four quarts of corn means as many grains to the acre of some kinds of corn as ten quarts does of some other variety.

Mr. Phelps. I cannot decide that. You will have to use your own judgment. The largest kernels you can get is the B. & W. corn. It is a very large corn, and of course takes more seed, and you want your corn to be a certain distance apart.

Q. Were we to understand that you put the whole corn into the silo?

A. Yes, sir; I want corn for my silo just as much as I want it for my crib. I want just as rich fodder. Then I have to balance it according to my own judgment.

Q. Can you raise your own seed from this Leaming corn?

A. Yes, I can raise it. Last year I did. It deteriorates, though. It is just about right as I get it from the seed man. I get my corn from the Whitney & Noyes Seed Company. It costs just owing to what corn is worth. But I have planted my Leaming corn and raised it myself.

Mr. Fox. What is the proper feed for a cow?

A. I feed about forty pounds of ensilage to a cow.

Mr. Fox. In measure what would it be?

A. A small bushel basketful.

Mr. Culp. I do not wish to have you understand that corn is the most profitable crop for farmers to raise. If you follow out what he recommends just tell me if it doesn't take labor. Time is money and labor is money, too; and it will take the richest kind of a soil to raise a crop of corn; where you can raise two and one-half tons of grass to the acre.

Mr. Phelps. Doesn't it require good soil to raise two and one-half tons of grass to the acre?

Mr. Culp. Yes, that is true; and yet I say it is easier and cheaper to raise a crop of grass than a crop of corn. You cannot keep it up; and your meadows will remain for a number of years. Mr. Phelps takes twenty acres of ground for corn; and then you have to take the expense of the plows and drags and everything together; and then cut it and put it in the silo, and all that; and I could not recommend it to our farmers as the best crop to raise, as a general thing. I don't say but what corn is a good crop. I have cultivated it and cleaned it just as carefully as I possibly could, and I find that it takes nearly all a man's time when he is growing it. Your grass will start right up and take care of itself. In growing corn you go through with the cultivator and have the roots on top, and you have to go through right away again. It don't kill the weeds. Now, he says he goes through his twenty acres with a hoe. How far will a man go through a twenty acre piece with a hoe in a day? I have raised corn for fifty years, and the cheapest way you can make it, and the best im-

plements you can use, you have to work, and work hard, to get out the weeds and get a good crop of corn. Now, with grass you don't have to do that. You have your machinery; and with your loader and hay forks you can put up hay pretty fast. Tell me whether when it is cured it is not good food for horses and cattle, with a little grain fed with it? I won't condemn his theory, but I say corn is not as profitable as grass. He has to hire men and pay them for helping to take care of the corn crop. I would like to know where his profit is.

Mr. Brush. I have not cultivated corn quite as long as Mr. Culp has, but I have cultivated corn for over forty years. I took a meadow that only produced a little over a ton of hay a year, and plowed it up and put it in corn; and the year before it didn't pay for the loading and unloading; and that year I put it in corn I got 88 bushels of shelled corn to the acre. Last year after hoeing time I went through with the cultivator. I put a very light coating of manure on it and plowed as shallow as I could. I expect to plow that up and put it in oats, and expect to get two or three tons to the acre of hay. I use the corn as an instrument to get my meadows ready. It has been this way with me, as I have heard it said—"plenty of corn means plenty of everything." This is just about the way it stands with me. But I want to tell the farmers what I believe in regard to planting corn. Most farmers, I believe, put in twice as much seed as they should—no difference whether you are getting it ready for the silo or the crib. I will say that the richer the ground the heavier seeding you may do. I don't believe that any seeding should be made thicker than one stalk to three square feet; but we don't always get it just as we want it.

President Crawford. We shall have to close the discussion now. This is an important subject, and we might take it up again at some other session. We will now hear from Prof. H. J. Waters, of the State College.

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## HOW TO BUILD UP A DAIRY HERD.

Prof. H. J. Waters.

### Discussion.

Mr. A. L. Wales. I want to ask a question. Suppose you take good care of your heifers, and turn them out to grass in the spring on good pasture, and they come up in the fall fat enough to kill, is that detrimental to their development?

Prof. Waters. I am not certain about that. I am not certain but it is; and yet it may not be enough detrimental to warrant you in feeding grain in a section where you practice grazing. Grass is a well-balanced ration; but it may not have the same effect as though you fattened those animals on highly carbonaceous foods. You will probably have better results in the end if you feed your heifers in such a way as not to get them fat. There would not be enough difference, however, to warrant you in feeding grain in a section where you are grazing. My remarks would apply to Eastern Pennsylvania where they do not practice grazing, or but very little.

Mr. H. M. Cutshall. Is tuberculosis more prevalent in some breeds than in others?

A. Tuberculosis is more prevalent in very highly bred animals than it is in the grades. The Shorthorns are comparatively free from it; but you take the finer ones that are fed for the showrings, and I know that tuberculosis is not uncommon with them. The Jerseys that have been used for the production of milk and butter, and kept in warm stables, have the best conditions for the spread of this disease. The same is true of the Guernsey and Holstein. These dairy animals that are bred and developed in this line are less rugged, less able to withstand this disease. One breed is not more subject to it than another.

Q. Would you advise killing any and every animal that would respond to the tuberculin test?

A. Yes, sir. In one instance the test was applied and the cow responded the first time, and the second time she didn't. They killed her and found her very tuberculous. I am not a veterinarian, but yet the test is so simple that the chances are very largely against a mistake being made. I should kill every cow that showed unmistakable signs of being tuberculous. For the manufacture of butter the milk is not necessarily injurious. It may be sterilized or pastuerized. I should prefer pastuerization. If you can keep a cow so the contagion will not spread, she might live for years, and might never die of tuberculosis. That animal should be kept absolutely free from the rest of the herd. It affects the manure before you put it on the land. Be certain that you are not getting your land infected with it.

Mr. J. C. McClintock. Do you not have to weed out these cows every year?

A. We have made two tests, but have found no indication of tuberculosis.

Mr. McClintock. In New York they were quarantined for a year, and then re-tested, and they found no tuberculosis. The animals were quarantined and pronounced all right.

Prof. Waters. I would not like to say that that work was not carefully done; but I know a case in this State where a man got tuber-

culin enough to test three cows, and he tested 40 or 50 cows, and not one was affected, according to his report. There is danger of this work not being properly done. We have tested twice at the Experiment Station. When we killed the three animals, we killed two others that showed physical signs but did not respond to the Koch lymph.

Mr. McClintock. I know of an animal that was pronounced sound, and was really very tuberculous.

Q. Has it not been charged that this test would aggravate the disease itself?

A. It has been charged; but I believe scientific men say that it will check the disease. I have known of positive cures resulting from the use of this lymph. It is held by good veterinarians that there is nothing in the theory that it aggravates the disease. Our attention was not attracted to this so much until recently. I believe however, that with our system of stabling and handling and keeping our cows, the danger of spreading the disease is increased; and on that account I think it is more prevalent in the distinctly dairy districts than it was some time ago. Where you pasture, and your cows take a great amount of exercise, I should not expect tuberculosis to be prevalent.

Q. Can you tell the difference between a cough of a bronchial nature and a cough of a tuberculous nature?

A. A cow may be affected in the brain, the intestine or the udder, and it won't produce any more of a cough than if you had a tumor on your finger. Then they may have tuberculosis of the lungs and you would never know it only by the wasting away. It will do you good to think about this thing and get ready to face it. You can help to keep it away from your animals by giving them ventilation in the stable. You have no occasion to fear in this district if you are careful.

Q. Mr. President, I would like to ask Mr. McClintock if the cow he referred to had been examined by a veterinary surgeon.

A. I had quarantined her myself and found she had it in the very worst form. She showed no signs of tuberculosis at all. He asked me what made me think she had it. I told him that I had discovered it by a little plan of my own; I examined her thoroughly and was satisfied that she had it; and I think every competent dairyman, if he will study his cattle, can tell whether his cows have tuberculosis or not.

A. L. Wales. If there is any one thing the farmers have made a success of in this section, it is in the ventilation of their barns. (Laughter.)

Mr. Fox. Can a cow contract the disease in any way except through the breath?

Prof. Waters. She can get the disease in various other ways. She might take it through the food that came into the stomach; any inflammation or indigestion; in case there are germs in the food. Suppose one of the animals of the herd had tuberculosis of the lungs or any of the breathing organs, and some of the matter should pass from it by running at the nose, and another cow should eat that—then it might be that that cow would have tuberculosis of the stomach or of the bowels. It might be that she would have tuberculosis on the outside. I saw a case where a man had a well-developed case of tuberculosis on the side of the finger from dissecting cows affected with it.

Q. I would like to ask if it is possible for a cow to give off the germs of tuberculosis through the breath.

Prof. Waters. I do not know. Veterinarians differ on that point.

Q. Is not the development and spread of this disease among the herd just the same as among the human family?

A. Precisely the same thing.

Q. These samples of milk that you take—how much do you take for a composite test?

A. It does not matter so as you get, at the end of the five days, anywhere from a half-pint to a pint. Be careful in drawing these samples. You are not making this test for publication, but you sell your butter by just what it contains, and it will require some skill and a great deal of care to get a correct sample. A young man in this audience has completed a year's work of this sort in his herd in the adjoining county; and he will tell you that it is entirely possible and that it does not entail a large amount of work.

A. L. Wales. We would be pleased to hear from Mr. Wells, of Warren county.

Mr. Wells. Mr. President, Gentlemen of the Association: As the professor has said, we (father and I) have completed nearly a year's record along this line. I came home from the Experiment Station the first of March last year. From that day every cow's milk has been weighed almost at every milking. Of course, once in a while we did not weigh it. Well, I guess I will have to take a little of that back. The first week of each month we made a composite test of every cow in the herd. We take a half-pint of milk and put it in a lightning fruit jar. Into these jars we put a little corrosive sublimate in warm weather; in cold weather we do not use any. We have a glass tube 12 or 14 inches long. After the cow is milked we weigh the milk and take three tests with this tube, and put them in the jar. Then, after carrying on the test for five days we make a Babcock test. We have a tester that cost us $8.00. We have a herd record book that cost us $3.50, which is nicely ruled. At the end of each month we add up the milk sheets for each cow, and then we

find the amount of butter fat, and of course one-fifth or one-sixth of that gives us the commercial butter. Before we began this test I thought we could not do it, and father thought just as I did about it, but we felt that is was necessary for us to do this to keep up with the times, and we started it. It takes but little time, only about half a minute for each cow. In our herd this year we find there is a difference between 316 pounds and 160 pounds—one cow made 316 pounds and another 160 pounds. You see that poor cow would eat up a great deal of the profits; but we hope to get cows that will produce more each year. The professor referred to the Experiment Station herds. I can verify his statements. I helped some with the first year's records at the Station. I find that we have 25 cows in the herd that average over 300 pounds. There is no question in my mind but that this test is entirely practical; and the thing we have to do is to keep up with the times.

President Crawford. Any other question? The hour for adjournment has arrived, but we were late in starting, and can stay a little longer. Any one that has any question that he wished answered, if he will write a note and leave it on the table in this hat, it will be answered this evening. If there is nothing further, I will say that we have an excellent program for this evening, and will also try and see that the house is warmed.

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## EVENING SESSION.

Music by North Shenango Grange Quartette.

### Question Box.

Q. Is a person liable to contract consumption from using either butter or milk from a diseased cow?

Prof. Waters. As I stated this afternoon, I am not a veterinary surgeon, and I am not authority on this subject at all. There are circumstances in which it is highly probable that a person will contract tuberculosis from the use of milk from a tuberculous cow; and there are one or two cases on record where this disease can be traced very directly, almost as directly as it would be possible, under the circumstances, right to this. From the use of butter made from the milk of tuberculous cows I doubt whether there would be any danger. At least the probability would be exceedingly small, since the germs would have passed out with the skim milk. I might say in this con-

nection that the system would have to be in a very favorable condition for the contraction of this disease. You might use milk that was full of tuberculous germs, without any danger; but if the stomach or bowels should happen to be in a diseased condition, the danger of contracting the disease is very much augmented.

Q. (Addressed to J. B. Phelps.) How much do you feed each cow from your silo?

A. Forty pounds a day; divided into two feeds.

Q. (Addressed to J. H. Weller.) Should dehorning be practiced?

A. I say yes, from my own experience. I experimented on this last winter. I had a dairy of twenty odd cows, and furnished milk here to the city; and I had some trouble occasionally with cows getting loose in the barn and by cows being hooked by other cows; and I came to the conclusion that I would have their horns taken off, so I had them taken off eight head at once. Four of them were fresh, or had been fresh from ten days to two weeks. My neighbors said I would regret having them dehorned, and that they would shrink on their milk; but they did not. I couldn't see any difference. It didn't take away their appetite at all. They did just as well as ever; and those that bled the most healed the quickest. I waited about three weeks, and then sent for the party to come and take the horns off the balance of my cows; and of those several were due to calve in four days, one cow in two weeks, and one in three. I found no difficulty in taking the horns off them. They came in at regular time, and have had no trouble with them at all. I can herd them like you do sheep. They don't hook one another. Some think it is cruel. I would like to know which is more cruel—to take those horns off, or to have the cows hooked by other cows. I consider that it is less cruel to take the horns off than to leave them on. It makes them submissive. I traded last spring for a good two-year-old bull, and the man I got him of said he was perfectly quiet, and I thought he told the truth. I brought him home and he wasn't very quiet; he drove me and my hired man both out of the yard. We clubbed him and got him into the barn, and along in June he got very cross. He drove my boy and horse. I concluded that I would get the horns off. I got them off, and he is as quiet as my pet sheep. I wouldn't take $50 and have the horns on my cattle again.

Mr. Wales. I just want to say in regard to making pets of two year old bulls, that it won't work, horns or no horns.

Mr. Weller. Well, I don't think there would be as much danger of him hooking with the horns off as with them on. I have known cases where men have had to go to State's prison for a term of years, and we thought it would stop them from committing crime, but they had to go again.

Secretary G. H. St. John. I would like to ask if it would not be

more humane to just kill those horns when they are calves. They claim that the treatment is entirely painless.

Mr. Weller. I cannot answer that from personal experience, but I know it from others. They say they have something that they put on the heads of yearlings, but I have never seen one but what a bunch grew out on the head. It always deforms the calves. If you destroy the germ entirely it won't grow.

Mr. Crooker. Is it not a mistake to suppose that it leaves holes in the heads? They have holes there anyhow. Saturday I turned my cows out to water, and I have a two year old heifer that is not dehorned, and she hooked another heifer and there were two places where it was cut clear through, and I think that hurt worse than dehorning would. In reference to it making an animal quiet, I have had bulls that were quiet afterwards, and I have had those that were not. I have one that is dehorned—a three year old—and he will put his head in the halter as quiet as a horse. I notice my heifers that have horns on are liable to hit me with their horns when I go in to clean out the stalls; those that have no horns do not touch me. The other cattle feel safer too. I think it is the best thing we can do for our cows.

Mr. Weller. Speaking about leaving a hole in the horn, I found but one that didn't have a hollow horn, but in a few weeks it will be healed up as hard as any horn. The horn of one was perfectly solid.

Mr. Phelps. A year ago on the 12th day of December, we had twenty-six head of cows dehorned. Some of them were not fresh; most of them were. We saw no particular difference in the quantity of milk; and we saw a great difference in the handling of the cows when they were turned out. I agree with Mr. Weller. I wouldn't have the horns on my cows again for $100, for the reason that they are not afraid of one another, and this nervousness has a great deal to do with their progeny. They are safer, and they are perfectly docile. In regard to dehorning calves, I wouldn't do it at all. I allow my heifers to run by themselves, and when they come into the stable to become cows their horns come off. They are cows then, and attend to their business; and what I want them to do is to give milk. I don't want them to fight. I want them to attend right to their business; and I shall never again have any horned cattle on my farm. I shall wait until they are two years old and then take the horns off.

Prof. Waters. What objection do you have to dehorning when calves?

Mr. Phelps. In dehorning calves a bunch grows on top of their heads. When the calves are young they commence bunting and

pushing one another; and then if you just let them go until they are almost cows it seems to take away their weapon, and it seems to take away their love of fighting; but those muleys will beat Corbett on a push.

Mr. McClintock. I should like to show you a picture I have at home, to show you the effect of dehorning.

Mr. Weller. I see Mr. McClintock is not in favor of dehorning. He has a grand herd of Jersey cattle, but if Miller & Sibley would take the horns off their cattle I think McClintock would have his off, too.

Mr. McClintock. I wouldn't have the horns off my cows for $5,000 to-day.

Mr. Weller. Oh, it is only a question of time; you will come to it.

Mr. Crawford. I would say that a box of dehorning fluid of some kind has been sent to this Association to be tried, and if the treatment is successful it is to be paid for. I know nothing about its merits.

Mr. McClintock. I would rather be hooked to death than bunted to death.

Mr. Crawford. By disposing of every cow that did not make 200 pounds of butter a year would you not increase the price of butter and put it out of reach of the consuming public?

Mr. L. C. Magaw. At the rate oleomargarine is being brought into the country I do not think there is a probability of an advance in price. I am no dairyman. Mr. Phelps could answer that question better than I can.

R. H. Eastman. I don't believe it is best to get rid of the cows that don't make 200 pounds of butter this year. I think we will make a start in the right direction when we begin to feed our cows, and we may find that we have 200 pound cows in our barns to-day. You know we hear a great deal said in farmers' institutes about a well-balanced ration. I don't believe the cows are suffering from the lack of a well-balanced ration half as much as for a good, wholesome ration and all they want of it. I know that there is many a cow in the state of New York, as well as in Pennsylvania, that if she is properly and judiciously fed on good food, will become a 200 pound cow. We have to-day, thousands of cows that could be made the foundation of the best dairy stock on the face of God's earth. It is the lack of ration they suffer from. Don't condemn the cow because she doesn't make 200 pounds of butter in a year until you have fed that cow, and have seen whether she is responsible. It will surprise you to see how quickly she will come up to her normal condition. We want to develop our cows. They haven't lung capacity enough; they haven't breathing capacity enough. I wouldn't con-

demn a cow because she doesn't make 200 pounds of butter until after I had tried that cow to see whether she will respond to the feed.

Q. Would not the proper place to begin to build up a good dairy be to provide a good stable?

Prof. Waters. We, in Central and Eastern Pennsylvania, have too good stables. I did not realize the force of Mr. Wales' remark that the farmers here were very successful in ventilating their stables, until it was explained to me. I dare say that a good, warm stable, with plenty of light and an abundance of fresh air—not necessarily cold air—would be a splendid thing, and one of the first things to provide in building up a herd. If I may be permitted I would like to make a remark on the 200 pound cow. How much money can you afford to invest in feeding cattle in endeavoring to get out of a 125 pound cow 200 pounds of butter, when by doing so you increase the cost of her food away beyond he value of the butter you get. It is a perfect absurdity to suppose that any man will do this. If you have in your herd ten cows that will not produce 200 pounds of butter, and you know you can select ten cows to take the place of these, and can pick them up at a reasonable figure, isn't it a point of good business to get those cows and quietly let the others go? There is no necessity for a revolution in this matter, but the dairyman must meet competition, and he must meet it by doing away with all the experiments possible, and I say it is not foolish to do this when he can add ten dollars to the purchase price and get a 200 pound cow. He will save money.

Q. What is the correct temperature in the stable?

Prof. Waters. We aim to keep the temperature of our barn down to 70, and do not let it get below 55. We keep thermometers in each stable. Our stable will run from about 49 to 75, occasionally to 80. If we had a better system of ventilation we could better regulate the temperature. We have not an ideal barn by any means.

Q. How can you get fresh air without getting cold air on a day like this?

Prof. Waters. We couldn't, to-day. But you can introduce it in such a way that it will not come directly in contact with an animal that is, warmed up a little. We have a system now that is being put in. It doesn't look as though it would work, but yet it does work. That is, to have a double wall, cut a hole at the bottom of the outside between the siding, cut a hole at the top of the inside, and the air will pass up through that, and the cold air is introduced at the top, and being heavier will settle down and drive out the hot air and displace it in that way. It is perfectly rational. You prevent a draft by allowing the cold air to get in at the top and disseminate over

the barn. That necessitates taking some of the hot air out at the bottom. Ventilation is a big question, and one that you must be very careful to watch.

Mr. Crooker. Mr. Waters says if you haven't cows that come up to 200 pounds to quietly let them go; but the chances are that if a man went to buy a 200 pound cow he might get hold of one that the other fellow had "quietly let go." I am feeding a cow that was recommended to me very highly, and I trusted the fellow I bought her of, and I am going to let the butcher have her. I have heard men talk about lying in horse trading, but if some men will lie more in horse trading than they do about their cows, they are pretty good liars. If a man starts out to buy a cow that will produce 200 pounds of butter, he might find it, but the chances are he would not. That is my experience. You may have had a different experience. Occasionally a man will tell you the truth about a cow. Suppose you buy a cow and test her before you get her; even then you cannot tell how long it is going to last. You must experiment, and you might as well experiment on the cows you have and find out what they can do, and find out whether you are feeding what they ought to have. I believe that there are cows that it doesn't make any difference what you feed them, they won't pay. Some cows will make butter cows, and some will go to fat, and some you cannot feed to anything. I believe a man is as safe in experimenting on his own cows as to try to get 200 pound cows from some man that won't tell the truth about them. We don't know what our cows are worth. Nineteen farmers out of twenty, yes, ninety-nine out of a hundred, don't know what their cows are doing at all. We have the Babcock test, and I hope people will have their scales too, and know what their cows are doing. I have seen men who pretended to be judges of cows, and I wanted them to tell me the best cow in the herd, and nine times out of ten they would pick out the poorest cow in the herd and think she is the best—that is, I thought she was the poorest. So I say when you go out to buy a 200 pound cow for ten dollars more than you would have to pay for a 125 pound cow, you don't know whether you are getting it or not, and you are not going to get her for ten dollars more, either. If you get her for $100 more you are getting her cheap. A man had better knock his poor cows in the head. If a rich man cannot afford to keep these cows, a poor man certainly can not. There is more in getting a good herd than just the buying of cows.

Mr. Phelps. A man will step over to his neghbor's herd, see a certain cow over there, see her milked, see the Babcock test applied and she will produce two pounds of butter a day, and he will buy her and pay a fabulous price for her, and take her home, and after trying

her will say that his neighbor is a liar; and the truth is, the cow suffers from the change in treatment. I would advise you to raise your cows from your very best stock. A cow wants to stay right where she is born. She will do better for you than for any other man. She has gotten in the habit of staying there, and if you are only reasonable she will do better for you than for any other man on earth. I know this by experience. I had a cow that I thought was A No. 1. I paid $45 for her, and it was a big price in those days. I kept her two years and she wasn't half a cow. I used her just as gently as any cow I ever had, and she was a failure every time. I have bought cows at auction and had the same experience. It is the force of habit in the cow. We find it in everything about the cow. Take a cow and test her milk every day and she will vary, and you may find that it is because the dog has chased her.

Mr. Crooker. I have bought cows and taken them home and they did just as well for me as for the man I bought them from. Brother Phelps does not always find them that way. I haven't any worse neighbors than he has. I had a neighbor who told me what his cow was giving, and I went and milked her and she didn't give half of what he said she did.

Mr. Lefever. I want to ask Phelps a question. A man would be loath to believe that he does all that dairying he talks about himself. Does he milk all those cows himself, and be so kind to them and all that? And does he never change hired men and isn't there about as much difference in changing hired men as to move his herd across to his neighbor's farm? I believe the hired man has more to do with it than the change of surroundings.

Mr. Phelps. If these gentlemen, and Mr. Lefever, think I am the pink of perfection, they are very much mistaken. The point that I want to enlighten you on is this—just as you and I when we go into a strange country, feel strange, so a cow feels strange when you change her from one place to another. Now, the changing of the cow is not cruelty; my neighbor is just as kind and careful as I am, but it is a change from his farm to mine. I got a cow and placed her in my herd and she never gave the milk I wanted her to. She was homesick, and never recovered while in my herd.

Mr. Weller. Crooker says there are ninety-nine out of one hundred that don't know what their cows are doing. I must be the hundredth fellow and Brother Phelps the other one. I know what my cows are doing. I bought a test glass from Magaw some time ago—about twelve years ago. It tells me the percentage of cream, and that percentage will be there every day, and you can tell pretty nearly how much butter that cow is making every day. A cow is simply a machine, and the kinder you can be to that cow the better

the results will be. I keep a dairy, and in my barn on both sides is a sign, "No talking while milking." I hired a man and he said, "What does that mean?" I said, "It means just what it says." I said, "I have no objection to you talking as much as you please before and after milking, but I don't want you to talk while you are milking." He asked why. I said, "You are down there the fourth or fifth cow from me, and I ask you something, and you have to stop milking while you answer. That is injurious to the cow." I allow no man to hurt a cow under any circumstances. If she kicks me over I wash out the pail and go at it again. I turned off the best man I ever had because he struck a cow with a stool.

Adjourned.

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## WEDNESDAY EVENING.

President Crawford. Mr. R. H. Eastman, of Waterville, N. Y., is with us and has offered to give us a little talk. I take great pleasure in introducing Mr. Eastman.

Mr. Eastman spoke as follows:

Mr. Chairman, Ladies and Gentlemen: I want to set myself right, because I didn't offer to do any thing of the kind. I was in attendance at an institute at Jamestown yesterday and the day before, and was due at Randolph today and tomorrow. I heard incidentally that the State Dairymen's Association was to meet here, and I said, "I want to go down to Meadville and hear what they have to say." The Randolph dairymen said they would make arrangements so that if I got back tomorrow it would be all right. I came here to absorb and not be squeezed. They said they wanted me to make a little talk. There was no offer on my part to make a talk here. I came here to get what I could, and go back to my own work to-morrow morning.

Now, in talking to you I shall take up a little trip that I made on the other side two years ago, simply that I might see something of the dairy industry in other countries. It was carrying out a fixed purpose that had been in my mind from my boyhood days. I saw an account of the eruption of Vesuvius and the destruction of Pompeii, and I made myself a promise that I would stand some day in the streets of old Pompeii. The day came and I went. What I may have to say to you I say simply as a farmer. It is very unfortunate that I am to take the place of Mr. Adams, a man who has reached a

lofty eminence in his profession. I say that it is a little unfortunate for you that I am called upon to take the place of that man in an address.

In the discussion today, Prof. Waters gave us a talk about the cow and the way and manner of building up a dairy herd. I was very much interested. We must guard against certain things in this country relative to our dairy cows. We are treading upon dangerous grounds, sure as we live, because we have had placed in our hands machines that have been bred and developed by man only in that line, and those men can go nearer the verge of the precipice than we can, and they will know when to stop.

My talk will be a kind of ollapodrida. That is a favorite Spanish dish made of a good many kinds of vegetables. We would call it "hash."

There were 1,450 of us on the steamer that I went on, and we consumed over 300 tons of coal every 24 hours. You see at that rate a man could get on the other side of the pond at a rapid rate. We landed at Queenstown at 11 o'clock at night; passed through the custom house, had our baggage examined and no dutiable goods found there. We took an Irish railway train, and no sooner had we taken our seats than the door was shut and locked. No communication between the front and back of the car. There were with Mrs. Eastman and myself three gentlemen. It was not pleasant. I did not like the idea of being locked up on the other side. The train arrived at Cork, and the next morning we started to see the sights of that city. I wanted to visit Blarney Castle. The walls are from five to twenty feet in thickness. Climbing over these walls was the beautiful English ivy. We took the trip in a jaunting car, and it was a very good thing for that kind of roads. A drive out through that country was instructive and entertaining. We noticed particularly the homes of the peasants on the road to Blarney Castle. I wanted to kiss the Blarney Stone. One who kisses the Blarney Stone may want for ideas, but never for words; so we went and kissed the Blarney Stone. To kiss it you have to get upon your knees; and Mrs. Eastman is glad I didn't kiss it twice. From there we went to Killarney, the home of the little Killarney cow. A little black cow that gives a very fair flow of milk, and milk of a very good quality; but she has never been thought enough of to be imported into this country; but she is a nice little cow and the ideal of the Irishman, as much as some of these cows on the other side.

In the extreme south of Ireland one is besieged with beggars asking you to buy something. Never have I seen a more courteous people in my life. They never crowd themselves on you so as to be offensive. They are always polite and courteous; and if you want the true Irish wit you must get it from the Irishman at home. While going

up there Mrs. Eastman made a bargain for a little piece of jewelry made out of the bog oak. The beggar's parting blessing was: "God please you may live until the skin of a gooseberry will make your coffin." Traveling through that country gave us a good idea of the homes of their peasantry. The architecture is almost identically the same. The low stone wall, whitewashed; the roofs thatched with straw; and about the cottage is almost invariably a little of the English ivy over the walls; and almost invariably a few plants, not perhaps the costly ones, but something that blossoms; and you will find them in nearly all of the dooryards of the homes of the Irish peasantry.

In South Ireland we saw something of the agriculture of that country. The people of South Ireland seem to have a great dislike to labor; and you will find in all the villages spirits for sale—something to drink. Wherever you find a crop growing you will almost invariably find it well tilled. You know in the state of New York many men are driven to hoe their corn just because the weeds have started. They don't seem to think of cultivating the crop, but only to get ahead of the weeds. It is a dispensation of God that weeds grow in the crops, for that is the only reason some men have for going into the crop to weed it. On our way to Dublin we had a chance to look at the crops, and there was something peculiar about them. The holdings of the tenantry are very small. Two or three acres make a good sized field. The shape of the fields and the colors displayed in them we could liken to nothing but the crazy quilts our wives make. As we drew nearer to Dublin we could see a difference in the agriculture. We noticed that the cattle were growing a little larger. Then we visited Belfast. It is a beautiful city, devoted to the manufacture of linen. From there we went to visit the Giant's Causeway. It is in the county of Antrim, in the north of Ireland, and is a vast collection of basaltic pillars, and in the back of the causeway was a great crevasse in the rock, 75 to 100 feet wide. You have no doubt heard the legend of this causeway.

Near this Giant's Causeway I saw as fine timothy hay growing as I ever saw in my life, and as fine potatoes as I have ever seen in this country. I saw, too, almost the typical Ayreshire cow. After visiting this part of Ireland, we then went to Scotland. In going to Glasgow we passed the home of the Hereford cow. There I saw this cow in her beauty and perfection. That cow with the beautifully shaped head that gives one the idea that she has an immense amount of courage and resources. She has the little neck and wedge-shaped shoulders that we have been looking for, and a good fair-shaped abdomen, and the finest udder in Scotland; but while they have been developing that udder they have forgotten one thing. They have forgotten the teat upon the udder, and there it is about an inch long.

That cow lacks in that one requisite. You know that nature assists man wonderfully in whatever he attempts to do. There is that beautiful cow with the slim neck and thin skin and hair. You have only to go about 100 miles north of that and you will find a beef breed of cattle. Nature has assisted man there. The animals in that country must have stronger constitutions than the animals in the lowlands, so they have developed the Kyloe. The Kyloe is an animal that has a very long broad head. They have a shoulder of the beefy type, and give but little milk. It does not rain in that country like it does here. All at once a mist will come down so thick that in the space of a few minutes your clothing is wet through, and you don't realize that it has been raining at all. Now you see that nature has helped that animal up there. It must have a muscular constitution. The cow on the lowland does not need that muscle. Just like the Clydesdale and Shetland ponies—you could not change their places and have either animal do as well. It would take a long time to have them become acclimated.

Then we had the pleasure of seeing the grandest of all bridges in the world—that across the river Forth, having a span 1,700 feet long, 100 feet longer than the span of the Brooklyn bridge. It is 9,000 feet in length, and cost almost $14,000,000. I am not going to stop long in England, although it is an interesting country, and we can go back and take many valuable lessons in agriculture from the English yet. They have gone to work to build up their agricultural industries, and while we are just making a living at farming, they have brought agriculture up to the point where it is self-sustaining. There is no profit in farming here because we are farming on an expensive scale.

You know we have had the Durham, one of the best breeds of cattle in the world, and it was a sorry day for us when we failed to retain them. Wherever we find among our cows a grand cow, whose ancestors we can trace, we find Durham blood. These should be the foundation of our herds today. Don't know where they went or who got them, but they have slipped away from us. The Red Polls and Devons have come from England to this country.

We went from England to Holland, reaching the coast in the morning. I could see something that looked like a breastwork. Holland has been reclaimed from the sea; and in order to keep the sea back, they have built 1,500 miles of dykes that are from ten to twenty-five feet in height. This is the home of the Holstein cow. We were interested to see what became of the water that fell in that country. The country is intersected by canals, and there is always water standing in the ditches. Here the Holstein cow has been bred for nearly 200 years. She has never had to labor for her food. I saw in August as fine pastures as I ever saw in June in this country.

They cut their grass three or four times in the summer. I never

saw any hay there over ten inches in length. They don't want it to grow heady and develop seed. It is worth nothing as feed. They cut their grass green and feed it to their cows in the winter. The Holstein cow never gets but a very little bit of grain. What has it developed? It has not developed muscle. She has the smallest muscles of any animal of the bovine species. She has been developed for the making of milk. It is not any trouble for her to make food into milk. In North Holland the milk has been made into cheese. In Friesland the milk of Friesians cow has been given to the making of butter. It has been said that we are housing our cattle too closely. There is a difference of opinion about that. In Holland the cows go into the stable in the fall of the year and stay until spring. They depend upon the dairy cow for their support in that country, and they feed the cow to get the most out of her. She occupies the same house with her owner. I have gone through the cow stable to go through the front door of the house. You know that if a man gets the best out of a cow he must understand her sympathetic nature. There is a bond of sympathy between the Hollander and his family and the cow. It is pleasing to see those men go up to their cows and put their arms around their necks and pat them on the cheek. There is not a cow in the world that will give as much milk as the Holstein cow, and if you make her conditions the same in this country she will do as well here, but she does not know how to climb hills for her food. We must take into consideration how these cattle have been bred for from 500 to 2000 years.

In Switzerland we find the beef cow. A fair shaped head, strong and rugged, a heavy shoulder and almost straight barrel. Now, what is the conformation of these cattle? They have a heavy, short neck; and you never saw a cow in your life eat down hill. She is always feeding just a little above where she stands. This animal is more like the beef cow. She has developed muscular power. A cow that is continually climbing up and down these hills must develop muscle. I didn't see a cow in Switzerland but what was ready for the butcher's block. The Swiss farmer must cut his grass where he can. He must cut grass that is very much thinner and lighter than that grown in Holland. They grow a little rye. I saw the Swiss farmers carrying their hay on their backs in nets. They cannot drive a horse and wagon on the mountains where the grass is produced. They must cut it on the hillsides by the cow and goats. If these people could have what we are wasting upon our farms here they would be millionaires in a few years. They appreciate the value of manure. I have seen many of them with baskets of manure on their heads starting out to some little spot in the mountains where they had found a place that would raise a little grass. You will notice that in the various breeds of cattle that I have called your attention

to that country is adapted to the wants of the animal. The Irishman has a small cow because his home is small and Ireland is small.

The cow of Holland is not muscular because she has no use for muscle in procuring her food; while the cattle of Switzerland have the heavy muscular necks that have been developed by browsing on the hillsides.

I believe we can have in this country today the finest dairies in the world. It is not essential that we go across the water to buy our stock; but if we take animals that have been bred for one purpose and try to develop them for something else, it is small wonder if they go to pieces on our hands. When you find a cow that is responsive to feed, take her as the foundation of your herd. I believe in introducing new blood into our herds.

One question often asked me, is: "How can a man manage to get along in countries where they talk other languages?" It is difficult; but it better to stick to the English language than to try to speak in a language that you know nothing about. While I was in France a friend said to me: "I am going to purchase a pair of hose, and I might as well buy them here as any place else." I said, "I will go with you." Then I asked him if he learned his French from a native. He said he did, and we stepped down to a shop. The shops are nearly all attended by young ladies. We went up to the counter, and my friend asked in his best French for a pair of hose; the young lady asked him in the purest English whether he would have stockings or drawers. So I say you had better stick to the English language, because it is less liable to lead you into trouble.

I am often asked, too, my opinion of other countries in comparison to this. An American was traveling on the other side, and everything he saw he would refer his hearers to something in America that was far ahead of anything they had there. When he saw the beautiful river Rhine, he said: "Yes, the Rhine is a pretty river, but we have rivers in America that will beat that. The Hudson river is broader than the Rhine, and it has some magnificent summer homes on its banks. I think America is ahead on rivers. You have no rivers 1000 miles long in this country." A Dutchman called his attention to the falls of the Rhine, and he said: "Oh, yes; they are very pretty; but if you would put them all together it wouldn't make one quarter of our own grand Niagara." And after seeing the grand paintings of the old masters in Italy, he was asked if he was not convinced that Italy was head on statuary and painting. He said: "No, you have patched it up, and it looks very well; but ours is all new. No, I think America is ahead on statuary."

So I think after seeing the way agricultural industries are carried on in other countries that America is ahead yet.

## THURSDAY A. M.

President Crawford. I have the following announcements. We have a lot of the Columbia World's Fair tests for distribution. Prof. Montgomery, of Allegheny college, will give a test this evening of the different kinds of salt. We also have some butter packages for distribution.

## BEST METHOD OF IMPROVING AND KEEPING UP THE FERTILITY OF OUR FARMS.

E. S. Crooker, Union City, Pa.

Mr. President, Gentlemen of the Association: I have no paper to give you, but I will give you a little talk; and in giving this I don't pretend to claim that I can give you the best method of farming. In fact I am not sure myself, and don't suppose I know the best method myself.

If, in the course of my remarks, I make any statement that is not right, I will be glad to have any one ask me any question, and we have Prof. Waters, from the Experiment Station in this State, with us, who has had much greater experience in these matters than we can have, and if I bring out anything that is not right, according to his experience, I should be glad to receive, with the rest of you, the benefit of his advice and wide knowledge.

Upon the fertility of our farms rests the foundation of our success or failure. Of course, we all know that if our farms are not in a condition to raise anything we cannot make any money; it doesn't make any difference how good our cows are or how bright we are. If we can't raise anything we can't make anything. Our aim should be to get our farms under a high state of cultivation. They are not anywhere near what they ought to be. The question is how to get them there and keep them there with the least money and in the shortest time. Of course, there are a few fundamental principles that we will not disagree upon. One of the things is the manure we make at our barns. We should allow no waste there. Save the solids and the liquids, putting each of them where they belong. Some adopt the method of plowing under their manure and some top dress. That would depend on what you want to raise

and upon the nature of your soil. With the experience I have had on a loam and clay and a hardpan sub-soil, I have found that top dressing is the best method for me. That is, I am satisfied from the experiments I have been making for eight or nine years that I get a good deal more benefit from adding my manure on the top of the ground and keeping it there. My object is to raise hay. Some of you have different farms and different methods. You may be on a farm that has been kept up to a high state of fertility, where cows have been kept and everything is in good order. Your farm is not in the same condition as a farm that has been rented for several years. I happened to have the ill fortune to get on a farm of that kind. Everything had been sold off it.

Please do not think me egotistical if I use the pronoun "I" occasionally.

When I went to buy my farm nine years ago I got only twenty tons of hay from fifty acres of meadow. This last season I cut about 100 tons, and I find that it increased right along in production, although I have sold hay every year, more or less. I think my plan is a good one, because I can see that my farm is improving every year. My practice is to save all my manure, as I wish to be careful of it. I don't throw any manure out of my barn. As fast as I make it I put it on my meadows, and I find the earlier I get it on my meadows, the better results I get the next year. I have box stalls in my horse barn and do not haul the manure out from them more than once a month. I save all the liquids. The horses tramp it down. I use horse manure behind my cattle in the gutters. I have gutters that are tight, so I save all the liquids. A great many people criticise my method of keeping my horses in box stalls. They claim that the ammonia escaping will be injurious to the horses. But you will find that much more ammonia arises where you clean out the stable every day; but leaving it as I do when you come to haul your manure out, it is pretty strong; you would think so at least if you came into my barn when I am hauling it out. I was scattering it on my fields on Monday of this week, and some parties going along thought that manure smelled pretty strong. When it goes from the barn it goes right to where it belongs. It is not thrown out under the eaves. We don't want to throw away our manure. It is the farmer's bank account. If you want to improve a farm that has run down, it would be very slow work to get that farm to a high state of cultivation, and I believe the improvement depends largely on the manure you make on the farm.

I suppose the question will come up whether to buy manure or a commercial fertilizer. I have done both. I find in buying manure that I am apt to get foreign seeds that are not good for my farm.

The commercial fertilizers are better, and whenever I can raise a crop of clover I am doing as much good as anything I can do. It is in these long tap roots; the clover seems to have the faculty of taking nitrogen from the air and enriching your land. Where you have a gravelly sod soil it doesn't make so much difference. Where you don't have over six or eight inches, it is of great benefit to have it loosened up and let the air and light into it. Where you can raise a good crop of clover you are doing the best thing for your land; you have solved the problem. It very frequently happens that I can't get a crop of clover without the commercial fertilizer. Last year I failed with my clover. I did not get any. I sowed timothy last year and it started nicely, and I may get a good crop of timothy next year. I don't know but it would be best to sow clover there in the spring. If I thought it would catch right it would be best for me to do it. Clover is the cheapest fertilizer you can get. The question for each one of us is—what does my soil need, and what method will be the cheapest to get it in good condition?

Although I have not experimented as carefully as they have at the Experiment Station, I can judge from the general run of it. I have found that of the three ingredients—ammonia, potash and phosphoric acid, my farm is lacking in phosphoric acid. They will tell you when you speak of buying condensed manures, they will give you figures and the manufacturer will show you that the cotton seed meal that can be bought at $18 a ton has a manurial value of $28 a ton. Figuring that we only lose about 25 per cent. of that in feeding, it would be worth about $21 for manure costing you $18 and worth $21 after you feed it; so you get your feed for nothing and $3 besides. That is a good investment, if that is true; but you will find in your commercial fertilizer that there is about $20 worth of nitrogen in that, your phosphoric acid six or seven dollars and your potash four, nitrogen four or five—when you buy phosphates you pay in about that proportion. There is out of $27 worth of manurial value in your cotton seed meal after you have put it on your farm, about $14 or $15 of what is nitrogen.

If you raise clover you get from the air all the nitrogen that your farm needs. Then the question is, whether it is worth that to you and me. If our farms are lacking in nitrogen, then it stays in the ground like the other ingredients. If they are not used this year they are good for next year. They don't escape after being put there, but if you put on more ammonia than you need, it will be a loss. So you see this may not be worth so much to you and I. If you don't need ammonia on your land be content with what you can get from the atmosphere. It costs you nothing. We don't want to pay for something we don't want. What we want is to find out what our land really needs. Our farms need a balanced ration for

the plant food. On my farm I am satisfied that all I need is phosphoric acid for raising grass. For raising corn I would use some ammonia; it gives a rich growth; but I need phosphoric acid for almost everything, and in fact most of our soils are lacking in phosphoric acid. When you put back manure it is lacking in phosphoric acid. They tell you the liquids of the manure are worth more than the solids; so they are if you are looking for ammonia, but it might not be worth as much to you as the solids. There is more potash in our barn-yard manure than there is in phosphoric acid. If you have plenty of potash and ammonia, then buy phosphoric acid. What I want to say to you is this—buy just what you find your land needs, after experimenting until you are fully satisfied as to what it does need, and then do not buy what you do not need. Then, if it is phosphoric acid you need, the question is to find the cheapest method of getting it there. I have used acidulated South Carolina rock. That does me just as much good as the high priced fertilizers. There are thousands of dollars thrown away every year in buying things we don't need. Still I might treat my farm in a certain way that you might not be able to treat your farm, because your land might need something else. Make a study of your land, just as Phelps and McClintock made a study of their cows, and don't give your land something it doesn't need. It will not be necessary to continue this matter. Buy what you need in an available form. Don't be afraid of injuring your farms by buying commercial fertilizers. Get your land into clover just as quickly as you can, and in a few years you will probably get independent of commercial fertilizers. As I say, I sell hay every year. I will sell hay just as quickly as I will sell potatoes or anything else, and I don't pretend to raise crop after crop without putting something on. You must replace what you take off. Get just what you want and nothing more, and get it just as cheap as you can.

Q. Will clover do well on land that has no ammonia?

A. I do not think that any crop will do well on land that has no ammonia. When I went on to my farm it was all herd grass. There is no use in top dressing herd grass. If your meadows are thin, there is no use putting manure there. You must do it on your new meadows. My plan is to plow in the fall, and if I have a piece of herd grass on my farm I plow it in the fall and put on about ten loads of manure in the winter, and in the spring put on phosphoric acid. I have run it all out of my farm and am now cutting timothy instead of herd grass. It is not always a sign that your land is poor because you have herd grass. As I understand it the herd grass comes after the timothy and other grasses have run out. Something will grow there, and that comes in. In my meadow I have all the herd grass out, but it will come in again and I will have to plow it.

I cannot keep my meadows over four or five years; I have to plow it again and go through the same process.

Q. How did you find out what your soil lacked?

A. I was using a complete phosphate, which had a high percentage of ammonia; paid $32 a ton for it. Then I used another brand of phosphate which has not so high a percentage of ammonia, and I found I had just as good results with a less percentage of ammonia. Then I used ashes on my farm, and they did not do any good, either on my corn or grass. Then I tried it two or three years and it didn't do any good. I supposed it was one of the best things I could put on my farm. It is highly charged with potash. Then I became convinced that potash was not what I needed. Then I began to see that for seeding down after oats that South Carolina rock gave me just as good results. That is how I came to the conclusion that was what I needed for my land. If I find I am wrong, I will change it.

Mr. W. C. Holmes. Which is the cheaper, barn-yard manure at a dollar a load, delivered on the farm, or a commercial fertilizer?

A. I can take three dollars worth of commercial fertilizers and raise a bigger crop than I can with ten dollars worth of manure to the acre. A great many people say that commercial fertilizers don't last; but you know that we ought to put twenty-five loads of manure to the acre. There is twenty-five dollars. How many use that amount of commercial fertilizers? We use 150 pounds to the acre, which if South Carolina rock, wouldn't cost over $1.20, and we get a good crop. You put $1.20 worth manure on that same acre and you won't know it is there. People seem to think that because the commercial fertilizer only costs $3.00 that it doesn't do any good, or the same good. I have a neighbor who has been buying manure for eighteen years and hauling it on one of his meadows. A gentleman told him that he could not afford to haul that manure up there if it was given to him. He figured it at fifty cents a load, and could put on eight loads a day; but the man was right, he could not afford to put the manure on if it was given to him. A year ago, after haying I went and hauled out some of this South Carolina rock over about nine acres of my meadows. You can handle that and go into the house and it will be comfortable for your folks. I had a boy to drive and the hired man and myself got into the rear end of the wagon box and scattered it with our hands. We went over nine acres in three-quarters of a day. Last spring we put it on part of my farm out on another road from where I live, and going along there I could see the line where that was put on; and also in cutting it we could see just where the South Carolina rock was spread on. The stable manure last season during the dry weather after haying just burned out my grass. It is burned out so that I won't have any this year.

They talk about phosphate burning out land. It doesn't burn out where I top dress with the rock, but it did burn out where I top dressed with manure. Of course, you know our business is different from any other business in the world. A farmer has to have more brains to be a good farmer than anything else in the world. He needs to be able to work at more different things than in any other business. In farming you get your ground ready to put in your crops, and then it rains, rains, rains, and you have to go right over the same process. We know that some years phosphates don't do us any good, then another year it will do us a great deal of good, and so it is. One year's test with anything does not prove it.

Mr. Lefever. You don't buy any barn-yard manure, do you?

A. I have bought some. I buy where I can get it pretty good, when I have nothing else to do.

Mr. Lefever. How often do you top dress your meadows?

A. Once; until I plow them again. I have top dressed them, but I find that they will run out by top dressing after awhile.

Mr. Lefever. I top dress after I plow.

Mr. Crooker. I don't top dress a meadow that I am going to seed until I plow it. I use clover when I seed, and clover instead of manure.

Mr. Lefever. We understand that you fall plow, and that you haul out about ten loads of manure, and when you seed you use South Carolina rock. Then I suppose if you had thirty acres you would plow about ten acres a year, and that if you top dressed your meadows during the time you were cutting them, that you would have top dressed about ten acres a year. Consequently, you would manure about twenty acres a year for a product of about 100 tons of hay, with fifty tons of it sold. We cannot get the manure.

Mr. Crooker. If you cannot get the manure you must use more phosphate, or raise clover.

Q. Do you think twenty-five loads of manure is an economical way to use manure?

Mr. Crooker. I couldn't get over my farm at all if I had to depend upon manure. If I was going to raise a crop of corn and plow my manure under, as they do generally, and turn it back again for oats, I would calculate to use about twenty-five loads. I do not know that it is economical, and I may not be right in that.

Q. Did I understand the gentleman to compare twenty-five loads of manure to 150 pound of phosphate?

Mr. Crooker. Do not misunderstand me. I say that with 150 pounds of phosphate I can get a crop that you cannot get with the same number of dollars worth of manure. I don't claim it is worth that. I claim that a great many people use a small amount of phosphate, and because it doesn't last as long as manure, they condemn

the phosphate. I don't claim that 150 pounds of phosphate will last as long as twenty-five loads of manure. I say that people condemn phosphate and say it doesn't last as long as manure, when they will go and put on a good many loads of manure and only a small amount of phosphate, just enough to get a good crop for that year. Phosphate is in a more available form than manure. The crop takes it up quicker, and a small amount will do a good deal of good for one year, where a small amount of manure would not be seen at all. It is more available. It is not very satisfactory to put on a little bit of phosphate that way; I would use more than 150 pounds when I am using it. I say people condemn phosphate because they put on just the least they can to get a crop that year.

Q. Did you ever use land plaster in the horse stable to keep down the ammonia?

Mr. Crooker. I don't have to use it. You wouldn't find any smell at all, hardly, in my horse stable. I believe land plaster is good to use if you clean your stable every day.

Q. If you use land plaster does it not check the ammonia?

Mr. Crooker. It is claimed that there is nothing better than land plaster to take up the ammonia, and there is no question but what that is true.

Q. Suppose I should apply phosphate on a piece of corn for several years, and use manure on another piece for several years, will you please tell me what the difference will be in the two pieces?

A. I wouldn't depend on phosphate or manure either. You may take a garden and keep it just as rich as you have a mind to, and you will find that in the course of two or three or four years that you can hardly raise anything. You have got to get that humus in the soil. You have to bring the land back to its fertility. You get your land so that you cannot raise anything. I believe clover is the very best thing you can raise, and whenever you raise a crop of clover you are benefiting the land. In buying manure there is a certain risk to run of buying foul seeds. Some people consider the applying of manure a drudgery. There is nothing I enjoy more than hauling manure and spreading it on my land. Whenever my farm gets so it doesn't improve I shall not take the interest in farming that I do today.

Prof. Waters. I want to say something about the probable economical amount of barnyard manure to apply. We happen to be in a position to know something about that from fourteen years continuous work in that line at the Experiment Station. Our soil is slightly different from yours, so the results might not be the same with your conditions. We were growing on these plots the regular four course rotation—wheat, corn, oats and clover; not following in that way exactly, but the typical Pennsylvania rotation. Upon one of those

plots we applied 1,200 pounds per acre; on another 1,600 pounds, and on another 2,000 pounds; and from the 1,200 pounds applied every two years we had a slightly larger return at the end of fourteen years from all crops, taking the average of it, from the 1,200 pounds than from the 2,000 pounds; indicating that the application every two years of 2,000 pounds of barnyard manure was excessive, when we applied it every two years for fourteen years in succession. I don't think this would be excessive where you only made the application, every five or six years. Our subsoil is rather open, porous clay. The ground has been used for experimental work, and we were not able to get a very accurate or reliable statement of the previous treatment of it, but the soil was in fair condition when we began.

Mr. Crooker. If it had been in poor condition, do you suppose you could have had as good results from such a small amount of manure as you get now?

A. I doubt it very largely. I throw this out to show that it is possible to apply too much manure.

Mr. Crooker. Can't land be so good that it won't respond to phosphates very readily, anyway?

Prof. Waters. Yes, that is true; you may have so much fertility already that it will not respond so well.

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## DAIRY FEEDING.

Address by Prof. H. J. WATERS, State College, Pa.

Mr. President, Gentlemen of the Association: I see, after having become better acquainted with my audience (I don't mean this in any uncomplimentary way) that you are more in search of practical knowledge than of scientific knowledge, and I have concluded to get entirely away from my paper, and talk of some of the things that mean dollars to you. I shall try to tell you how you may get more money out of the feeding of your cows.

The first thing to consider is the nutritive ration. You must learn about these carbohydrates and fats, etc. I want to say here that there is no good and sufficient cause or excuse for a man remaining in ignorance of the meaning of these terms, and how to use them to make a perfectly balanced ration, when the information may be had free of charge, and made so plain that he can understand it by the

reading. The Experiment Stations of Pennsylvania and Ohio, and of almost every other state in the Union, have published full descriptions of these terms—what is meant by carbohydrates, albuminoids, etc., and how they may be combined to make a perfectly balanced ration for the dairy cow. All you need is to have your name on the mailing lists of these stations, and it costs you nothing but a postal card to do that. You must learn the meaning of these terms, and learn it soon, in order to feed your animals intelligently.

You should so combine your foods, and so supplement your crops grown on the farm, that you shall have a balanced ration. In the common foods grown on your farm, such as corn and corn fodder, there is a great deficiency of albuminoids and muscle-making material, and you are feeding at a loss there when you have a ration that is deficient in these. You are feeding at a loss, because your cow requires a certain amount of albuminoids, a certain definite amount. If you should be furnishing sufficient carbohydrates to make two pounds of butter per day, and were not furnishing enough albuminoids to make more than one pound, the excess of carbohydrates would be wasted. The cow could not use them. You say that you get the result in the manure pile. This excess is worth nothing to you as manure. It does not contain the element that you need. On the other hand, if you should be feeding an excess of albuminoids (the most expensive material in your food) and a deficiency of carbohydrates, you would then be requiring your cow to convert the albuminoids into a use that a cheaper form of foods could just as well furnish, and you would be feeding at a loss.

I simply want to impress upon you the importance of balancing up your ration so that you may study this question and decide it to your financial benefit.

We shall next come to the question of the amount of digestible nutrients. I would say that some of the experiment stations have taken a great deal of pains to gather up an account of the rations fed by leading dairymen of the United States, and have selected one hundred of these rations fed by successful dairymen, whose herds average over 300 pounds of butter. We find they contain a certain amount of dry matter. This is another reform that we must inaugurate. Instead of speaking of a pound of fresh matter, we should speak of it as dry matter. When we speak of 100 pounds of corn meal we speak of 90 pounds of dry matter, the amount of digestible nutrients contained in that. You find when you feed an animal, that a certain portion of the food passes through undigested. It is utterly worthless as far as the results you get are concerned. It is the amount that is digested that you are interested in; so that we are safer to speak of this food in the form of the amount of digestible

nutrients it contains. We have found by averaging these hundred rations, that while the average cow was getting per day twenty-five and a fraction hundredths of dry matter in her food, she was getting a nutritive ratio of 1 to 6.9. That means that for every pound of albuminoids furnished that cow 6.9 pounds of carbohydrates were furnished. If you have animals that are producing 200 pounds of butter you can afford to feed that quantity.

Let me say that no matter what directions are laid down, if you feed without common sense that it will wreck the best dairyman in the country. A man came to us to get some information the other day. He had been following the scientific plans, and was selling his butter for 55 cents in the summer time and 65 in the winter time, and yet losing money. He had failed to take into account the individuality of his cows. He had animals making 150 pounds of butter, and was feeding them on rations suitable for cows producing 300 pounds and over. He failed to take into consideration the fact that some foods were vastly cheaper than others. He was satisfied that when he had a ration that contained 25 pounds of dry matter that it contained a total of 16 pounds of digestible matter, and that everything must be all right. He was perfectly satisfied. I want to show you how absurd it would be to follow these directions blindly. In the first place, I have made some computations at the present price of material, taking the percentage of digestible matter that these different foods contain, by actual experiment. We shall consider that a pound of digestible matter is just as valuable from one source as from another. That is not quite true, but it is the best basis we have from which to compile notes of this kind. We find that silage at $1.50 a ton furnishes digestible matter at 39 cents per hundred pounds; clover hay at $10 a ton furnishes digestible matter at $1.11 per hundred pounds; timothy hay at $14 a ton furnishes digestible matter at $1.41 per hundred pounds; sugar beets at $3.00 per ton gives $1.20 per hundred pounds of digestible matter; mangolds at $2.00 per ton, $1.54 per hundred pounds.

Mr. Crooker. This ensilage is not stover. There is a commercial value in that corn.

Prof. Waters. I was figuring that at what it costs us. We figure clover and timothy at what we could buy the hay on the market. On corn at the present market price in our county at $20 a ton, the digestible matter costs $1.23 per hundred. Oats, $1.75; wheat, $1.35; bran, $1.48; and dry brewers' grain, $1.02; cotton seed meal, $1.23.

Suppose you should get these directions from the Experiment Station, and start to figure out your ration according to the basis I have just named, of 25 pounds of dry matter, 2.1 albuminoids, etc., and you should select the materials in that way. Suppose you should select timothy hay 15 pounds, corn meal 4 pounds, ground oats 6

pounds, linseed meal 3 pounds. You have an almost perfectly balanced theoretical ration. That ration would contain 2.09 pounds of albuminoids, 12.9 pounds of carbohydrates, and 6.2 pounds of fat, with a nutritive ratio of 1 to 6.8 instead of 1 to 6.9, as the total digestible amount; and 16.5 instead of 16.1; and that ration would cost you per day 24.6 cents per cow.

Let us take another. Let us supplement the ration we have just given by putting in 50 pounds of mangolds, and reduce the hay to 5 pounds per day; making it then—timothy hay 5 pounds, and the grain just as we had it before, feeding 13 pounds per day to each cow. We now have a ration that is narrower than the one we just named. It does not contain as large an amount of digestible nutrients; costs 22.7 cents per day. Let us see what might be done to cheapen that ration, at the same time keeping the amount of digestible nutrients practically the same. Instead of the timothy hay we will take corn stover, 5 pounds; let us take silage, 35 pounds; corn meal, 4 pounds; cotton seed meal, 3 pounds; and dry brewers' grain, 3 pounds. We put that brewers' grain in because it is an economical food, and to lighten up that grain ration—cotton seed meal and corn meal being very heavy. We find that this ration has more digestible matter in it than the one we named last before it, with the 50 pounds of mangolds, etc., with the nutritive ration about the same. This costs 13 cents per day; the other one costs 22, and the other 24 and a fraction. We have reason to believe that this last ration would give as good results as either of the rations named before. Now, that means a saving in one case of at least nine cents per day per cow. If you will figure that up on twenty cows for 300 days you will see the difference between profit and loss; a loss on one hand and a profit on the other. You see how easy it is to make that difference.

Mr. Crooker. What do you figure the corn meal at?

A. Twenty dollars. Having then the report of the Experiment Station of the State College, and having the market prices laid down at your station, it is an easy matter to make up your ration so that in shall form a scientific ratio and a nutritive ratio in the amount of material you shall feed, and shall be made of the cheapest materials the market affords. This last ration that costs you 13 cents per day, may cost you 15 or 18 cents next year. Next year bran may take a tumble, just as cottonseed meal did this year. It may be that gluten meal will be down and some other meal up. We cannot lay down any rule, because we do not know what the market may be; the thing to do is to get all the profit you can out of it. As long as you feed your animals not to impair their health, you are feeding in the best and most scientific way. The amount will depend largely upon the animals.

I don't know how much you can afford to feed your cows, and

probably you don't either, until you make some experiments and study these animals as individuals. With the experiments at the State College with cows that were making from 250 to 300 pounds of butter a year we found that as between 6 pounds of grain and 9 pounds of corn fodder; 12 pounds of grain and 5 pounds of corn fodder; and 18 pounds of grain and a proportionate amount of corn fodder, that there is a limit to the most profitable production that involves a feeding that we would regard as very liberal. Twelve pounds of grain and a proportionate amount of corn fodder gave the greatest net profit per year—gave a greater net profit than six, eight, nine or ten pounds. Passing beyond the 12 pounds for our cows we were getting beyond the point of the most profitable production; the net profit was being cut down by the increase in our feed bill. If we had 400 pound cows we might have passed the 12 pound mark before we struck the point of most profitable production. If we had 200 pound cows we might have struck that point at eight or nine pounds. We don't know. You must work that out for yourself. If we should answer that question and say the average cow should have 16 pounds digestible nutrients, that doesn't help you very much. You will be obliged to study your own individuals. It is just as absurd to say: "I will give this row of cows so many pounds, and this row of cows so many pounds," as to say: "I will give every man the same amount of meat."

Many cows are reduced in profit by not giving them enough food; while other cows are being fed in excess of what they demand for the most profitable production. You must study your cows. Take one individual and strike her capacity by increasing the feed. You don't need to weigh it except once in a while. Occasionally see how much you are giving her; and gradually increase that and give her time to respond, and you will be able to strike the limit of that cow in a little while, and you will know in a general way whether she is worth feeding, and whether she will be able to use a large amount of food economically. In that way you will be able to give her what she will use; and at the same time reach the animals that you wish to get out of your herd. It is a study of the individuals. That is the first point. Next is the form in which this food should be furnished. It is useless to insist that this food shall be palatable, and that it shall be furnished them in the form that will be cheapest for the farmer. For example, if silage is more profitable to the animals and cheaper for the dairymen, then have silage. And if it is more palatable to them to eat than corn in the form of silage without dry meal, let them have it that way. Cater to the appetite of the animal. Further than that, I want to say that the cheapest foods that we have are these that we would term "coarse foods. We can make up the bulk of our rations from our coarse foods, provided and

furnished on our own farms; and we shall buy to supplement these such food as we can buy the cheapest. But we must be careful that we get that coarse food in its most palatable form, or we cannot get the animals to eat enough of it. I firmly believe that the silage has met the requirements as between pasturing and soiling. You will get away from pasturing just as far as you can. You will do away with soiling and will depend on the silo all the way through.

Q. Is it not a fact that they do practice soiling in the eastern part of the State?

A. Yes, sir. In the eastern and central part of the State the good dairyman would no more think of pasturing his good land than nothing. We are getting away from soiling because it is expensive. We are growing on that land the food that can be grown cheapest per pound of digestible matter, namely, corn. We shall handle that in the cheapest way possible, namely, in the silo, and we shall be relieved of the trouble of going into the field every day and breaking in on our system of work, and we shall be relieved of the necessity of cutting immature stuff and feeding our cows on material that contained 75 per cent. of water one week and 90 per cent. of water another week. Every time we have changed to the green, watery stuff, we have had a loss in our milk. Mr. Wells will tell you that in the spring when our rye will be ready to cut for soiling, that when we began feeding, that the cows dropped off because the stuff was immature. There are only a few days when rye is in the best condition to feed to cows. A cow is never quite adjusted to her ration until she is changed to something different. There is a period when we don't have anything green to feed. There are a great many objections to the soiling system. Nor can we afford to grow roots; it costs too much. It costs twice as much as silage. It is hardly worth while to speak of the waste and loss that there is in what I call the "Pennsylvania dairy ration," viz: a mixture of corn meal, chopped oats and timothy hay. It has been found by experiment that oats are 10 per cent. better than bran, for the production of milk and butter. I have here some figures showing the value at the different prices. Oats was selling at 35 cents, $21.88 per ton; bran at $15.00. If you will add 10 per cent. of the bran and make it as valuable as the oats, then 2,200 pounds of bran would be worth as much as a ton of oats. Then for $16.50 we should be able to buy the equivalent of $21.88 worth of oats. In other words, we could haul a ton of oats to the railway station and get $21.88 for it, and get its equivalent in the form of the production of milk and butter, for $16.50, saving $5.38 in the exchange. One day I discarded the oats, for I wanted to make a high grade of butter for exhibition, because oats seems to have a property that no other food has in that particular respect. So I say we would have a saving of $5.38.

Mr. McClintock. Would that not depend on the quality of the bran?

A. I am speaking of good bran. This bran was spring wheat bran, the bran the feeders condemn most.

Q. Do you consider the spring wheat bran better than other bran?

A. I don't know as there is much difference. There are no experiments to indicate that there is any difference. There have been no experiments made to show.

Mr. McClintock. I know that I got better results from winter wheat bran than from spring wheat.

Prof. Waters. It has a slightly higher feeding value. Continuing the comparison between oats and bran, we would sell in that ton of oats $7.19 worth of fertilizer, and we would bring back in our 2,200 pounds of bran $13.15 worth of fertilizer, or a difference of $5.94. The grain of that oats is only worth half of that, and we have then $2.97, to which we should add the $5.38, making $8.35 made in the exchange. In these figures we made, corn was worth with us 60 cents a bushel in carload lots, and Buffalo gluten meal could be bought for $17.10.

Mr. Crooker. They tell me that the gluten feed is the best.

Prof. Waters. I have never used the gluten feed. I say that as between corn at 60 cents per bushel, or $21.40, and Buffalo gluten meal at $19.00, there will be $2.40; and that it will pay you to sell your corn and buy gluten meal. Corn meal being one of the cheapest grain foods you can use, I suppose this will not be of interest to you. I have no figures on cotton seed meal, but it is the second cheapest food we have at the present time. I was figuring it at $20.00. There is some force in the remark that this nitrogen may not be worth as much on farms that have been used for dairy farms for a long time. It is worth that to those who have been running dairy farms in a half-hearted way. On our farm, where a large number of cattle have been kept, a large amount of food has been bought—food rich in nitrogen—and we can get a good, satisfactory return from the use of barn-yard manure on that farm.

Mr. Crooker. Do you know anything about hominy meal?

Prof. Waters. It is the heart of the corn taken out. I should be afraid to feed very much of it to my cows. You can feed two or three pounds a day. Feed liberally. That is where your profit is—liberal feeding. This meal would be the cheapest food you could buy, at $15.25. These corn hearts for fattening pigs are the very best food you can get. Feeding a reasonable quantity to your cows you ought to get good results—splendid results. For finishing up the fattening process of your hogs it is the best thing you can get, except possibly linseed meal at $15.00; it ought to be very cheap. I

am basing my judgment of corn hearts upon my experience with them at the World's Fair. From my own experience and the observation and experience of other men, I believe it is not wise to feed these corn hearts to growing pigs. It furnishes fat, but does not produce any growth. It gets the animal's system all out of shape.

Mr. Phelps. Would it be a good food in connection with skim milk?

A. Excellent. It would be a splendid supplement to skim milk for pigs. There is a finish to a pig that will make him command a price in the market, and you will find the difference in the finish you put on a pig will make a difference in the returns you get from him when sold.

Mr. Crooker. Is not middlings as good to feed as the whole wheat?

A. Undoubtedly. It is better. It produces the best results I have ever seen with hogs. We would prefer to have that made up into a very thick batter or dough. I am opposed to feeding slop to hogs. There seems to be some good reasons for this. Have summarized all the work done on this line and find that dry food gives the best results with hogs. They tried it with thin slop and then thicker slop, and finally got down to dough, and then entirely dry and furnished the water separately. In feeding slop none of the saliva can mix with it, and the juices of the stomach cannot work upon it to the best advantage, and as it seems essential to the best results to have this food mixed more or less with the saliva, it is the best accomplished by feeding it dry. I don't think it would make much difference if the animals had been watered a reasonable length of time before feeding so that they will not be too thirsty. It would not be very objectionable to water afterwards, unless I had forgotten it before, and then only give them a small amount.

A Member. Tell us something about those cows that the butter was sold at 55 and 65 cents, at a loss.

A. I cannot explain that.

Mr. Phelps. Was it not on account of his balancing his ration with very dear foods?

A. Certainly; it must have been that.

Mr. Crooker. I want to talk some about the ration If you take winter wheat bran at $17.00 a ton; middlings at $18.00 a ton, and gluten feed at $19.00, and corn meal at $19.00, and clover hay and timothy, what ration would you give for a cow to give the best quantity of milk?

A. I would rather figure that out a little than answer it off-hand. I might make a mistake.

Mr. Fox. What would be the difference between cotton seed and oil meal?

A. In the oil meal you are buying digestible nutrients at about

$1.54, and in the cotton seed meal at $1.23. There is a beneficial effect from the feeding of oil meal on the health of the animal. If you can feed some very light food in with your cotton seed meal or dry brewers' grain, or it would be better still to add some roots or silage; but I should not feed largely of cotton seed meal because you are liable to disturb the digesting organs of your cattle. We have fed 5¾ pounds of cotton seed meal a day for thirty days, to ten cows, in connection with 13½ pounds of dry corn meal and dry corn fodder, and we have noticed a gain in the milk and butter, and did not notice no bad results at all; nevertheless I should feed cotton seed meal gradually.

Mr. Lefever. I would like to have you give the ration that you will feed to those calves that you are going to raise.

A. We are feeding ours bran, say 100 pounds; chopped oats, 50 pounds; linseed meal, 50 pounds, and corn meal, say 50. The amount you feed will depend upon the animal. We are supplementing that with clover hay; all the clover hay they will eat. We aim to give them just as much of this coarse food as possible, to develop their stomachs. We feed them just as much as they will eat to keep them in good condition and check them from getting fat. We feed occasionally some silage. When we speak of the "new process" we mean when the oil has been extracted by means of ether. We don't like it as well. We want it as a sort of a laxative to keep the animal's bowels in good condition, and when it fails to do that we have lost the very thing that we propose to use it for.

Mr. L. F. McLaughlin. I would like to ask your opinion of the ration I am using. I take four bags of ears of corn, two bags of oats and one bag of wheat to the mill, and get it all ground together, and feed three quarts of that twice a day to one cow, and the next food is hay and corn fodder, probably with apple parings, potato parings, with small potatoes, about four quarts every day.

A. The first objection to that ration is that it is too wide in its nutritive ratio. It contains too great a portion of carbohydrates. It is impossible to say just how that ration would balance up, but probably 1 to 8, or 1 to 8½, probably 1 to 12. In the second place you are using two comparatively expensive foods there, viz: the wheat and oats. We don't count wheat very expensive now, but count it at $21.00 a ton, ground, and you will have another serious objection to wheat. You are selling your oats there in a very cheap market. You are not getting 35 cents a bushel for your oats when you mix it that way. I am not raising any question about what you get for that butter or milk, but with what you get for that food you can buy food cheaper. You can buy cotton seed meal cheaper. Get dry brewers' grain or something of that sort, and it will be cheaper than bran and serve to lighten up that ration. Make it 250 pounds

of corn meal to 100 pounds of cotton seed meal, and 100 pounds of dry brewers' grain, and feed them in probably a little less quantities than you are feeding other foods.

Mr. McLaughlin. Is it any advantage in that ration to have the corn cob ground up fine?

A. If it is in hard flakes. You can get corn cob in such a condition that it is positively injurious to the animal. It is these hard flakes that will do the injury, and it is yet an open question as to whether you had better feed it whole or shell the corn and burn the cob and save the ashes and use it in that way. I am not able to answer that question positively, because opinions differ. If I were going to feed corn meal and cotton seed meal I would have the cob in, but if I fed brewers' grain I would discard the cob.

Mr. McLaughlin. We have been taught that the cob contains the phosphate that is essential in the making of milk. Seventy pounds of this corn in the cob is worth about 35 cents. The wheat is worth a little less than a cent a pound, not to exceed 58 cents a bushel; the oats a little more than a cent a pound. This ration mixed brings the feed down below $18.00 per ton. That ration is not expensive, inasmuch as we can grow it on the farm and put no work on it. The ration would be lightened up by using the cob.

Prof. Waters. There is a good deal of theory about the cob that is not backed up by facts; that is, so far as we know. Men sometimes have opinions without any good and sufficient reason for their opinions, and if I have any opinion in regard to that I have it without any good reason for it, because the thing has not been worked out, and it is a question that will have to be worked out very carefully before we can give a definite answer to it. You can buy cotton seed meal. We will help you out there. You can sell your oats and make money by the exchange.

Mr. McLaughlin. When the ration of potatoes is stopped the amount of milk decreases, if you stop it for a day or two, and when the potatoes are added the amount of milk increases. When the ration of corn fodder happens to be omitted for a day or so the amount of milk decreases.

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## TESTING MILK.

A. L. Wales. I would like to have Mr. Spitler explain the working of the Babcock test in his factory.

Mr. S. C. Spitler. Mr. President, I shall be glad to make a statement, and I wish there were more of the patrons here. It was some-

thing like this: Last spring the proprietors of our factory put in the Babcock test, and quite a number of the patrons of the factory had some misgivings about it. They were afraid of that little machine. So after the proprietors of the factory got so they could work it to their satisfaction, they sent out word with the milk haulers to come in and see their milk tested. The cheese maker had saved samples of the milk, and quite a number of the patrons had samples of their milk, and they put it in the machine and started it up. Of course you all know how it was done, and when they took out their little jars they found no separation at all. Instead of having anything to show in cream or butter fat, it was all mixed up. You may guess there were some people chagrined in that operation. Those that had been of the doubting Thomases got a good deal more so, and they thought that perhaps there was too much guessing when they came to make dividends, too. Well, of course, they failed, and the people went home and thought they didn't know much about the thing at the factory. The next morning, when I had occasion to pass the factory, the cheese maker called me in and said he had succeeded in getting a good separation. Well, he did have. Some of the samples were nicely separated; you would see a little butter fat at the top of the bottle, and in others bunches gathered through, showing an imperfect separation. "How will you do in that case?" I asked. "Oh, we will average it, you know," he said. I don't think a person ought to guess with that little machine. I think it ought to tell the straight story. That is the sum and substance of our experience. A great many in that community are dissatisfied with the Babcock test, and are afraid that they are not getting the proper dividends. They don't know whether the thing is right or wrong. They think that if it fails altogether sometimes, that it will fail partially sometimes.

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## THE BABCOCK TEST AND THE QUALITY OF THE COW AS DETERMINED BY IT.

Mr. I. S. Lavery, Lavery, Pa.

Mr. President, Ladies and Gentlemen: It is with a certain fear that I approach this subject today. This subject is one that has occupied the attention of dairymen of the United States for several years, and it continues to occupy their attention to a certain extent.

My remarks will be confined to the Babcock test, as determining the value of the cow. I find in my experience that those who have

tests of their own, and test their milk, need as much instruction in that line as many who pretend to test milk in a public capacity. The man who operates the Babcock test has as important a position as the man who sits upon the bench in your court house. That wrongs are committed, not intentionally, but through a lack of knowledge, we know; but there are wrongs committed intentionally. The most of the wrongs are committed from a lack of knowledge on the part of those who operate the test. Not every man who puts a milk tester in his factory, as was told you this forenoon, can, without experience, take the milk of A, B and C, and return to A, B and C a correct proportion of the money to which he is entitled, because he has been so unfortunate as to have been forced to operate a Babcock tester without the knowledge that he should have. The Babcock tester is like every other machine. It takes a good deal of knowledge and some experience. Now, any of us might be well versed in mathematics, and go up to your college and get the theodolite, and try to measure yonder mountain, and take our measurements correctly, but the crowd would look on and not know any more about it than the majority of patrons do when looking on when their milk is being tested by the Babcock test.

There are certain conditions necessary to properly test milk, and unless these conditions are present you do not know what you will get. Is it any wonder, I ask that there is a wail going up against the Babcock test? Not against the correct use of it, but against the abuse of it. I have not a word to say against it when properly managed; but when such men as President Gibbs, of the Minnesota Dairymen's Association, says there is more justice in the pooling system than in the distribution of money by the Babcock test, it requires our consideration. And such was the fact in many instances given in the meeting of that Association. When the milk is separated by incompetent men I would view the result with a certain amount of suspicion, at least. Now, I will give you a little bit of experience in relation to this in my own neighborhood the last season. A certain man whose milk I had tested for three years sent his milk to a neighboring factory for two and one-half months, where the man was a novice at the business. For the month of May he received a dividend based upon the returns of what they called 23, or 4.6 per cent. That is, they counted the fifths. It is more easy to get at the relative value of two men's milk by calling it 19 and 21, than it is to convince them of the relation of 3 8-10 and 4 2-10. By the time the latter has gone around the neighborhood it will be three and four. In using fifths we understand it and they understand it. Reduce it to fifths, and divide the Lavery schedule by five, that will bring it to butter fats. One man having 19 and the other 21 they can more easily compare their relative values than in

tenths. This man's milk in May was 23, and in June it was 17. No sooner did he receive his June statement than he took his milk out of the factory, and for the part of the month he sent it it was 19. That wrong that was committed was not through the intention of the operator. That man was a novice at the business; he did not know how to operate the Babcock test. In the fore part of the month of August he received 27 points, or 5.4; and the supposition was that the man tested his milk high in order to induce him to go to the neighboring factory. The man who did that simply went down in his neighbors' pockets for the price of about 1¼ pounds of butter that the man never furnished.

In running the test the first thing is the speed. There must be a proper, uniform speed. I have experimented some in that line, and have received returns just diametrically opposite to the returns that some men have received or reported. The disk must travel about 2,500 feet a minute. I usually run 3,000 revolutions a minute. I have run them with a duplicate sample of milk at 2,000 and 3,000, and I couldn't make one-half a degree of difference; but I have increased the speed to 5,000, about a mile a minute, and I have received .2 of one per cent. more out of the same milk than I did at 3,000 feet a minute. But those who have made experiments differing from my experiments claim that there is a something retained in the neck of the bottle that you are liable to read as butter fat that the churn will not recover if you run them at 3,000 feet a minute. Here is an objection against the steam test. I crossed swords with Prof. Gurler a year ago on that very point. The steam test is not safe except in the hands of an expert operator. Start an engine in a box, without a governor, and turn on the steam, and how do you know anything about how it is going? It takes more knowledge of the subject to run a steam test than a hand test where you will run very many revolutions a minute. You must get sufficient speed to force the heavier part to the outside of the bottle. It works the same in separating cream; the fat being lighter than the other ingredients, comes to the outside of the bottle. The acid must be of the proper density. Acid too weak will not cut all the fat; and acid too strong will destroy a part of the fat. I cannot tell exactly how it is. I believe that Gurler claimed that you couldn't destroy the fat. Another thing in opposition to the correct testing of milk by the Babcock test is lactic acid. Lactic acid is in the milk what I call "treason." No army ever succeeded that had treason in its own ranks. The greatest military genius the world ever saw was defeated on the plains of Belgium, not because Wellington was a greater general, but because Napoleon's army had traitors within its own ranks. On exactly the same plan is lactic acid in the milk. You don't know what you are getting. It is treason every time. Have the patron

bring his milk in proper condition, and keep it so. There is no method to get the lactic acid out after it once gets in. As your own experience will prove, no man will test milk and know just what he is doing when there is lactic acid in the milk. The Babcock test should be just as accurate as possible.

Another thing is necessary. The churn must follow the test; for if the churn is properly manipulated there must be a certain relationship between the output or readings of the test and the churn. The churn should overrun the test, although I have known factories where it did not. I referred you a few minutes ago to a case where a man made high tests. I wish to prove that man made a mistake. In that month it took 23.5 pounds of his milk to make a pound of butter fat, and the creamery I operate made it from 21, and still he had nearly one per cent. more, according to the readings of his test. I do know that it wouldn't have taken 23.5 pounds of milk to make a pound of butter if the churning and testing had been properly done. The probability is that he had allowed lactic acid to get control of his milk. As far as I am concerned, I know of no method of preventing guess work except to keep the lactic acid out of your milk.

We operate a creamery built in 1885, and I tested with an oil test churn, then I got the Shorts test, then the Babcock test; and it was just like the rest of them—black flakes would rise in the milk. As long as I had lactic acid in the milk I could never get a test I knew was correct; consequently, if you are getting your milk tested by the Babcock test, be sure your milk is delivered in good condition, and if there is lactic acid in the milk, do not divide the money on that basis. There ought to be very little guessing about it.

I have some figures here giving the average per cent. of water in butter from the churn over what the Babcock test has read. The churn must overrun the test. Your churn will overrun it about 12 per cent. In 37 samples, about 11.7 per cent., with the minimum of 5 and a maximum of 16.81 per cent. The average percentage was 13.73 of moisture in the butter. The percentages of fat in the neck of the bottle is supposed to be pure oil. Then we found the highest, 19.26, and the last five with an average of 12.96. So you will see that the churn must overrun the test. The test must come within about ten or fifteen of the churn.

I was going to refer you to some samples of testing for some few of the patrons where the testing was properly done. This was a composite test, being pure milk without any preservative, four samples in the month, promiscuously taken. Those of you who are feeding cows will learn a lesson from this. The test showed from 18.5 to 26 in 1894. It was a grade Jersey herd, and fed by a hired man in the winter who was not a good herdsman. His test was away down to 18.5 in May, and 26 in October. There is a gradual rise right along. It

it remarkable, though, how rapidly they rose. As I told you, this herd was not in good condition when turned on grass, and the Babcock test did not give the man what he expected. He expected it to be away up with the test of another man with a herd of the same breed. The other man was a sort of a fancy feeder. He started his cows out in the spring in a first class condition, and had a fresh cow later in the season. The test showed in July, 19.5; September, 22; May, 22; June, 24; August, 24; and October, 26.

The next man begins in May at 21, and ends with 23 in October. The next man begins at 23 and ends at 24. The next begins at 23.5 and ends at 24. This man introduced a little fresh milk. This man owns a cow for which Mr. McClintock offered $100 a year ago. We now come to one of the low men—17, 19, 19.5, 20, 20.5. I might carry this further, but this is far enough to show you that testing properly done will not give 23 in May and 17 in June, from the same herd with the same conditions.

(Mr. Lavery introduced the following chart, from which he showed the result of experiments with the Babcock test, showing the relative value of cows.)

Chart.

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| Average of Herd— | |
| 1. Skim milk from separator, | 1.5 |
| 2. Skim milk from shallow setting, | 4.5 |
| 3. Skim milk from deep setting (water 44 degrees), | 10.5 |
| All milk of same cow— | |
| 4. First milk drawn, | 11.5 |
| 5. Average milk, | 22.5 |
| 6. Last milk drawn, | 34.5 |
| 7. Home-made buttermilk, | 7.5 |
| 8. Same as No. 5, but cow whipped, | 13.5 |
| 9. Same as No. 8, only subjected to action of lactic acid, | 12.5 |
| 10. Sample of rich milk, | 35.5 |
| Acid too strong, | 34.5 |
| Acid too weak, | 32.5 |
| 11. Sample of poor milk, but twice the quantity of rich milk, | 18.5 |
| 12. Milk from same cow as No. 10, only cow fed on oat straw, | 68.5 |
| 13. First half of milk, ¾ Holstein cow, | 8.5 |
| 14. Same cow as 13, but sample of all the milk, | 13.5 |

You see by these experiments that shallow setting is much better than deep setting for the milk of cows long in lactation. It is impossible to recover all the cream in the milk by the deep setting, and it is also impossible to recover all of it by any method of setting.

(In the remainder of his talk, Mr. Lavery made frequent reference to the chart.)

There are few men who can recover all the cream at that season of the year from that quality of milk. The owner of that milk lost 77.5 cents. The cow did her duty because she gave milk that the test said was worth $1.20 a hundred, but the man has only sold 77.5 cents worth of butter from that $1.20 worth of milk. Here are three samples of milk from the same cow. The first sample is the first milk drawn and tested. It tests 2.4 per cent. Here is the average milk of the whole milking. The first is 11, the last 34, and the average 22. You owners of cows, impress upon your hired men the importance of getting all the cows give. Make them do as the German I had once—always pull away, and try to make the cow give a little more, for one drop of the last milk is worth more than three of the first.

Here is one question I wish to call to your mind. This is a sample of the same milk as No. 5. That is a half-blood Holstein cow. She gave 22 marks on the test bottles; 5.4 was her average. After milking she was allowed to stand just 24 hours, and particular care was taken that she should not be excited in any way, and when I went to milk her I didn't do as I heard a good dairyman say he did. He said: "I scratched her with a pin." I consider that an abnormal way of doing. There is a disposition on the part of a great many dairymen, and especially hired help, to talk loudly to the cows, and abuse them and thump them with the milking stool if they don't happen to stand just right. I went to milk that cow I was speaking of, and pretended to be angry with her, and thumped her with the stool. This is the same cow whose test showed 22 points of butter fat in the test bottle, and everything being similar she showed just 13 after being scolded. I lost nearly two pounds of butter fat on the hundred; that is, if the Babcock test told the truth, and I did it very carefully. Here is another I wish to call your attention to. Here is a sample of the same milk tested after the action of the lactic acid. I told you it was impossible for you to get a correct reading with the presence of the lactic acid. There was a sample of milk that was subject to 90 degrees of heat for 72 hours; and I want to tell you right now that you can't make the same development in this season of the year that you can in June or July. Had that milk been subject to the heat of one night last July, lactic acid would have developed four times as much as it did in my experiment. But everything being in its favor, I lost two-tenths of one per cent. I lost one-fifth of a pound of butter fat by the slight acid that was developed in that milk at that season of the year. It was in December. I have never had the acid curdle milk. Here is a sample of rich milk. That milk tests 7 per cent. of butter fat; 35 points by the Lavery scale.

Here is a sample of her milk which tests 18. Now, if any of you were buying these two cows upon their quality, without knowing anything else, you would very readily give more for the 35 point animal than for the 18 point cow. The truth of the matter is that the 18 point cow gives more than as much more than the 35 point cow. The scale of the test given in that case regulates the quality of the cow. And right here is where some patrons of creameries make a grave mistake. They are always trying to get a high test. That is all right if they have the quantity. But my experience is that the best cows are generally the big milkers. This 18 point milk, or 3 5-10, only lacks 1.26 of being twice as good as the other, and the cow that the test has indicated as being poor in butter fat is worth more than the other cow.

Here are two samples—one of very rich milk, one of the first half of the milk, and the cow poor in butter fat. One of my neighbors had a cow that had been giving milk but a short time. A young man came to their house that had no teeth, and I wanted to experiment a little in relation to the poor and rich milk for the baby. The buttermilk tested 2.6. This was very rich milk, 68.5, 13.6 per cent. of butter fat. I had an object in view. I knew nothing of the quality of that milk until after I had tested it. This is a sample of the same cow that tested 35.5 the month before, and she showed nearly twice as much butter in the month afterwards, and I wanted to compare it with that milk poor in butter fat.

(Showed the solids in one pound of milk testing 13.5.)

I took this to the apothecary and got him to weigh it carefully, and here we have one ounce, four drachms, fifty grains, as the solids in one pound of that milk that tested 13.5. Here is the solids out of one pound of the other sample. It was done carefully; weighed by the same man. The test is four ounces and two drachms.

Mr. Phelps. What are these solids composed of?

A. Everything that would not evaporate from the milk, until by the application of heat and evaporation they will become no lighter. A sample taken from the same as No. 5, taken at a different time, about a month afterwards, and it tested at that time 22 points. Those of you who think you can feed butter fat into a cow, *if* you can, should remember that you can also thump it out of her with a milking stool. It is like Paddy's blanket, it is as broad as it is long. I don't believe you can feed it in. There are men sending milk to the creameries who imagine that if they feed their cows rich food they will give rich milk. I will anticipate your question.

There is a sample of milk taken just one month after that sample, from the same cow. When that sample was taken the cow was running to pasture and getting all the corn fodder she could eat. She tested 34, or 5.7 per cent. of butter fat—perhaps a month after-

wards when she had been fed for two or three weeks on nitrogenous food, oats straw and nothing else.

Mr. Crooker. What quantity of milk was she giving?

A. About half as much as when I took the very poor sample of milk. It was like Paddy's blanket again.

I have another thing to bring before you about which I communicated with the health department at Erie. They wrote me certain things that they had found in their experiments, and they convinced me that my samples were very nearly correct; if not, you can send them to the Experiment Station and correct me. He says they took 10 S. S. We use C. C. in the same connection. "Pure milk never falls below 11.8." That is what he says. This is 11.2, according to my way of figuring. I figured it myself, and lest I might be mistaken I got a pedagogue, a teacher of boys, to test it. According to our way of thinking we have as the actual amount of solids in this sample of milk, which by the health department was found not to fall below 11.8—in milk containing 12.5 solids there were present 3.2 per cent. of fat. And he wrote me in another letter that he had never tested milk at that station that tested over 4 per cent. I think those cows drank a good deal of water. The highest percentage of solids that has been tested here is 13.9 solids. As I told you, I am not a chemist. I have done almost everything though, but preach and fight. If my figures are wrong they can be corrected. I told you my object in taking these samples. I don't know but what I will be brought up before the council for heresy. If I am, I will be like Galileo, and will say, "It still goes 'round." My object was to ascertain whether the Babcock test was a proper method to distribute money at a cheese factory.

It was reported at the World's Fair that the solids in the cheese keep pace with the butter. I was always skeptical; I never had faith in that. They will tell me, perhaps, that my samples were abnormal samples. The doctor goes to see a man, and before he pronounces him having the fever he must find his temperature away up and his pulse high. If you are sampling milk at 4.2 or 4.8 and 4.5, there is not much difference there in these samples of milk. You can see the butter fat in them. Here is a sample of the solids of one pound, which weighs four ounces and two drachms. We figured that at 26 9-16, but to get at it so we will understand it better we will call it 26.6 per cent. of solids and butter fat. Taking out the 26 per cent. we have just 13 per cent. of solids, not fat, in that sample of milk. In this sample we have one ounce and four drachms and fifty grains out of 16 ounces. We have 11.2 per cent. of solids. The whole solids in this sample of milk is 11.26. Two and six-tenths per cent. of fat taken from that leaves 8.6 per cent. of solids. I take the test by

evaporation. I have simply experimented this way to draw your attention to something that may be of more importance to you than listening to me. The relative worth of this rich milk by the Babcock test in the cheese factory and by evaporation is as 5 to 2⅓. Do you know what conclusions I came to in that? The conclusion I came to was this—that I wouldn't send rich milk to the cheese factory. I came to the conclusion that the proper way to do would be to give a certain per cent. for the solids.

I find this subject has been discussed some publicly, and I knew nothing about it. All these experiments were made before I received this copy of the National Dairyman, published by Mr. Monrad, and a certain man named Wheaton has criticised Prof. Dean, of the Bulletin, in which he claims that the Babcock test of the per cent. of fat was not exactly just in paying for milk. That is just what I have been trying to illustrate. (Read article by J. H. Monrad, from February number of National Dairyman and Dairy Messenger.)

We feel sure that Prof. Dean could come to no other result than that the Babcock test was not correct in dividing the money in a cheese factory.

You will all agree with me that it is not just to compel an honest man to submit to an injustice in order to catch a thief. If any of us are unjustly accused of a crime in yonder court house, and we say to the judge, "Better that ninety men guilty go unpunished than one innocent man suffer," the judge will say, "No, this is the law, 'Better that ninety-nine men suffer who are innocent than that one guilty man escape.'" But here the whole trend is to catch the dishonest man, and they admit that the Babcock test is not a good method, but in order to prevent the dishonest man perpetrating fraud, they will defraud the honest man who brings his milk to the factory.

Q. I would like to ask Mr. Lavery if, when he struck the cow with the milking stool, she went down in quality as well as quantity?

A. Yes.

Q. Suppose you had tested the cow in the next twenty-four hours, would the butter fat have gone above the first test?

A. I think not.

Mr. Holmes. In regard to the samples of skim milk and butter milk that were taken, where the man figured that he lost 47 cents out of $1.20, if we feed that butter milk to the pigs and the skim milk to the children, ought not the growth of the pigs and children to be counted out? (Laughter.)

President Crawford. Providing he had enough children and pigs to utilize it.

Mr. Holmes. Every well regulated family should have.

Mr. Lavery. I have never seen where it was used for any purpose except the production of heat in the animal body, and rich skim milk would be better to give the boys on a cold morning.

Mr. Wales. Do you claim that the Babcock test is not a competent test for the cheese factory?

A. That is my opinion.

Mr. Wales. Then you think the cheese factories of Wisconsin are working under a mistake?

A. I think as Prof. Dean and Monrad say, that they are not absolutely correct.

Mr. Wales. How did you secure that 13 per cent. test when your milk bottles are only scheduled to 10 per cent.?

A. I measured it with a rule. I have bottles long enough to hold that.

Q. Then do I understand that if the milk you are testing has tested the same lactic acid, your sample is not correct?

A. As Prof. Frear said, "You must guess at the test from the amount of acid used." I hold that there is something wrong when you have to guess at the amount. He said, "You must guess at the amount from the acid. You must guess at the amount used and not use so much sulphuric acid."

Mr. Phelps. In regard to those solids—does he claim that those solids are retained in making cheese?

A. No; there is a part of them that is not valuable.

Mr. Phelps. We might arrive at a wrong conclusion. There is nothing in these solids retained in cheese but the casein and fat; the other materials all pass away with the whey. You have a large percentage of solids from the fats, and those solids show the discrepancy for the reason that the solids are not retained with the Babcock test, we do not have the value of the solids.

Mr. Lavery. I understand. Suppose we added 4 per cent. for cheese in each case, or suppose we make it 5 per cent. for the rich and 3 per cent. for the poor. Then you don't have the same ratio, even.

Prof. Waters. Would that 13 per cent. milk make cheese that would sell for more on the market than that containing only $2\frac{1}{2}$ per cent.?

Mr. Lavery. I think it would. I understand they can make cheese out of cream.

Q. If milk has more of the solids and not more of the fat in the milk, is it worth more for cheese making?

A. The samples show that the solids do not keep pace with the butter fats.

Q. Would that have anything to do with the Babcock test?

A. The Babcock test indicates the amount of fat it contains, that is all.

.Q I understand you to say that we do not have it very correct because it does not measure the other solids in the milk?

A. I didn't charge the Babcock test with having any mission at all but ascertaining the amount of butter fat in the milk.

Mr. S. J. Logan. Will there not be a difference in the value of the cheese made from two different samples of milk?

A. I am not posted as to that, at all.

Mr. Logan. If the butter fats constitute the value of the cheese you will have from one sample a skim milk cheese and from the other a whole milk cheese. I would think that the Babcock test demonstrating that fact would be a good test for cheese as well as butter, because the butter fat constitutes the superior value of the cheese. That would be my view of the matter.

Mr. Lavery. I don't want to be understood as claiming what the gentleman has stated. I have nothing to do with the price. I want to say that the solids measure not in proportion to the butter fats.

Prof. Waters. You said that the man who furnished rich milk was being robbed and the money given to the man who furnished poor milk. If this milk will make a cheese that is richer, doesn't it follow that after all the Babcock test is a practical test of the cheese value of the milk, and is it not true that the man who furnished poor milk ought to be paid less?

A. My answer would be like this—The rich milk makes the better cheese, consequently very rich milk must make cheese that would sell for enough more to make it worth five times the amount of poor milk cheese. That there is a difference in milk, and that the Babcock test will indicate that in the cheese factory, I am not trying to contradict. I allow the cheese makers to come to any conclusion they see fit as to what they would give for the casein in the milk.

Q. Does not the casein increase in proportion to the butter fats in any of these samples of milk? Does not the casein increase in the 5 per cent. milk in proportion to the fats? The milk producing 5 per cent. of fat is worth as much again as that producing $2\frac{1}{2}$ per cent. fat.

A. I don't know. I told you I was no cheese maker.

Q. You take 100 pounds of 5 per cent. milk and 100 pounds of 3 per cent. milk, and take all the butter fat out, add your rennet, and then dry your curd of the two samples. You will know exactly how much cheese there was in those two samples. It has been decided that the richer the milk in butter fats, the richer the casein and the better quality of cheese. Last August I went to a factory over here in Ohio and we made a test the first day, taking 164 pounds of milk that tested 2.9 per cent. fats; also took 2.44 per cent.; also 3.5 per cent., making an average of 3.6 of butter fat. This was put into

a small vat for the occasion, made 36.5 pounds of cheese; taking 11.17 pounds of milk for a pound of cheese. The next day we took 400 pounds of milk that tested 3.6 per cent. of fat. That 400 pounds of milk made 41.5 pounds of cheese. It took 9.53 pounds of milk for a pound of cheese. I cannot say but what with the experience I have had it is the only fair way to compare the cheese factory with the creamery. In my opinion it is a decided fact that the food fed to a cow has as much to do with the quantity and quality of the milk as that fed to a horse. You feed a horse on buckwheat bran and straw and you will see that he is not in very good condition. Feed him with oats and it certainly will produce fat. Horses will take on flesh, while cows will increase the flow of milk as well as the quality of the milk. I don't like the pooling system of running the factory. I disagreed with Mr. Wales at the farmers' institutes at Springboro, but I have been thoroughly convinced from experience that the only way to pay, for the cheese factory and creamery, is by the Babcock test.

Mr. Lavery. This question of food has been argued pro and con. My experience has been this—that if a cow is in poor condition she may be brought up to her normal amount of butter fat by proper feeding. A horse may be hog-fat and not in what horsemen call good condition. I think the experience of all feeders is that you can increase the quantity up to the quality of the cow, but beyond that you cannot go.

Secretary T. J. Edge. Is it not a fact that every cow has her normal capacity for butter fat? You can increase the quantity of butter fat in the milk until you get to the normal point, but cannot increase it beyond that.

Mr. Phelps. The butter fat business is a big question and the more we study it the less we know. If you read the record of some of these high grade cows you will find that in one year they gave a great quantity of milk, and the next year they gave a less quantity of milk and made more butter. These tests were made by men who knew and handled the cows, and you can find the record of these cows in the report of the American Jersey Cattle Club.

President Crawford. We will have to close this discussion. We will listen to Thos. J. Edge, Secretary of the State Board of Agriculture.

## FERTILIZER BRANDS AND THEIR MEANING; ILLUSTRATED BY CHARTS.

Thos. J. Edge, Harrisburg, Pa.

(The address given by Secretary Edge was published in full in the State Agricultural Report of 1894.)

## ELECTION OF OFFICERS.

J. B. Phelps nominated H. C. Crawford for President.

S. J. Logan nominated. Declined and seconded the nomination of H. C. Crawford.

E. S. Crooker moved that the secretary be instructed to cast the vote for Mr. Crawford for president.

Motion seconded by Mr. Andrew Story.

Mr. Crooker moved that the nominations close.

Secretary instructed to cast the ballot.

Mr. H. C. Crawford. Gentlemen, I thank you very kindly for the honor that you have conferred upon me. I will endeavor to perform the duties which will devolve upon me to the best of my ability.

We are ready for other nominations.

Mr. S. J. Logan nominated G. H. St. John for Secretary.

Motion seconded by George Orris.

Mr. Crooker moved that the nominations close.

Mr. Orris moved the Mr. Heydrick cast the ballot for secretary.

G. H. St. John elected secretary.

Report of nominating committee called for.

No committee had been appointed.

Mr. Geo. Spitler moved that the rules be suspended and the old board elected.

Motion seconded.

President. It has been moved and seconded that the former vice presidents act as vice presidents for the ensuing year.

Mr. Phelps. I object to that.

After discussion, motion carried.

Adjourned.

Thursday evening Dr. J. H. Montgomery gave a talk on "Salt," and was followed by a stereopticon lecture on "Farming in the Northwest."

Prof. Waters made the following statement:

Mr. President, Ladies and Gentlemen: I am authorized by the State College, your own State institution, to extend to the Pennsylvania State Dairymen's Association and its friends, and to the dairymen of Northwestern Pennsylvania, and the dairymen of Pennsylvania, a cordial invitation to hold your next annual meeting or any succeeding meeting at the State College. I do this so that we may better come together, and that you may know more fully what the college is doing in your interests. I do this, not because Meadville is not a good place in which to hold the meeting (for certainly I have been treated most magnificently while here), but we will guarantee you just as good treatment, and we will guarantee you better weather than we have had this time (and I feel safe in saying that, because we do not have such severe weather once in ten years), and we will guarantee you a place that is reasonably accessible; and the coming together of these dairymen would certainly be productive of great good and stimulate us to better efforts.

I would like to say one word further about the work the State College is doing. In the first place, the Experiment Station has been criticised by other institutions for devoting so much time to the investigation of dairy problems, connected with dairy breeding, feeding and management, and the problems that concern the butter maker.

We shall take up in a short time the cheese work; and as soon as we have facilities we shall offer to the manufacturer of cheese a thoroughly first-class course; and we are now offering a thoroughly first-class course in butter making. We believe that we do not have to take a second place to any institution. And that is best illustrated by the fact that during his course we have been churning with a loss in the buttermilk amounting to one-tenth of one per cent.

It is a thoroughly practical course. We offer a course for the dairy farmer, and one for the general farmer, of six weeks for the private dairymen and twelve weeks for the general farmer. The institution is intended to be as intensely practical as it is possible to make it. We aim to familiarize the students with the principles of chemistry as applied to agriculture, with crop fertilizers, silos, and all these questions that are now absorbing the farmer. These courses are offered free of charge, except $5.00 of actual expense to the young man while there. The total expense of the course is about $75.00. That includes all expenses. This is not confined to the young men, for we have a man over 55 years of age who is pursuing the course, and we have had men older than he.

We are now making preparations, if we are successful in securing some aid from the State Legislature, to offer a three years' course in agriculture, that you may have some interest in—not a regular college course, but to establish a School of Agriculture that shall have a course of five or six months in the winter. The students will be trained in mathematics sufficiently to understand the things that are necessary; and in mechanics enough to be able to do any of the ordinary blacksmithing and carpentering on the farm. It will not require the same preparation as the entire college course; for a student having completed the three years' course, if he finds his mind runs in the direction of scientific agriculture he should connect himself with some agricultural journal. He may be fitted in these three years to enter college. He will have an opportunity to be thoroughly equipped.

I will not trespass further on the exercises that are to follow, and hope to have the Dairymen's Association meet with us, if, in your wisdom, it is best to go there, and we will try and make it as interesting as possible.

Dr. J. H. Montgomery, Allegheny College. Ladies and Gentlemen: I want to add a word to what the professor has said. I had the pleasure of attending the commencement exercises of the State College, and I must say I was very highly pleased. They certainly have an excellent outfit for doing the work of the institution. Of course we cannot offer a course in agriculture in Allegheny college, but we do offer to your sons and daughters a course leading to degrees that will fit them for any of the walks of life.

If I were going to spend my life on a farm, I would be happy to have such an education, and would advise every father to give his sons the benefit of our colleges.

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## OLEOMARGARINE—WHAT SHALL WE DO WITH IT?

W. C. Holmes, Lyona, Pa.

Mr. President, Ladies and Gentlemen: When the secretary of this Association notified me that I had been chosen to prepare a paper to read at this meeting he didn't state how long the article should be, and if it proves too long I hope you will lay the blame where it properly belongs. (Mr. Holmes proceeded to read from a very small piece of paper containing an outline of his talk.)

Now, I have no apology to make for any ideas that I may suggest. I don't know but perhaps an apology is due to this audience in regard to my grammar. It will be according to Holmes, and not according to Kellog.

It is a matter of history that wherever an article has become noted and has become a necessary requirement of the people, that it has almost universally been imitated and counterfeited. One of the products of the United States for which we have been noted is our butter. I think it has enjoyed the position that Selkirk did—been "monarch of all it surveyed," more than any other article; but it remained for the people of this nineteenth century to make a counterfeit of butter—oleomargarine. It is something like the bottle that the Irish traveler found. He said, "What have we here?" He shook the bottle up and looked at it, and it looked like whiskey. He took a taste of it, and said: "Be jabers, it is whiskey." This bogus butter may look like butter, but it doesn't smell like butter, and it doesn't taste like butter. But the trouble is, it is here; and now the question I am to talk on, is, "What shall we do with it?"

I don't expect to solve this problem; I don't propose to, either, but am only going to present to you why it is a dangerous enemy to our industry.

First, we may make laws to prohibit the manufacture and sale of it. It is easier to make laws than to enforce them. You have attended Farmers' Institutes and other farmers' meetings where petitions were circulated asking that the State Legislaure and powers that be appropriate $25,000 to enforce this law. That shows that it requires something more than the law to have that law enforced. If we were granted that $25,000, which is half as much as our president gets for a year's salary (the poor fellow) how would we go to work with it? Then if we got that appropriation, what would follow as a matter of course? The Prohibitionists, who are tireless workers in their cause, would immediately ask for an appropriation to put the laws into effect that are already existing in regard to the sale and manufacture of intoxicating drinks. I am not saying anything for or against the oleo law. I am only trying to show up some of the reasons why this enemy to our industry of butter making is a more powerful enemy to get rid of than we thought it was.

Now, many advocate the idea that this present law should be repealed and another take its place.

We know that there is quite a margin connected with the sale and manufacture of this oleomargarine. As farmers and laboring men we have been crying out against class legislation. Would it not be class legislation to prohibit the sale and manufacture of this article, if it is wholesome? If it is not a wholesome food then we have laws already passed against dealing in unwholesome and impure foods.

I am not very positive on that point; but suppose that the present law should be repealed and another take its place, how would we enforce the new law? People have to brand this article and sell it for what it is.

What would hinder the wool growers of this State asking that a law be passed prohibiting the manufacture and sale of any cotton goods in this State? There is no cotton grown in this State, but there is material grown for making the oleomargarine. They would be keeping out an industry from another state, while we are not doing that with the manufacture and sale of oleomargarine, for the ingredients are grown in this State, to some extent. If there are men who prefer this oleomargarine for themselves and families in place of butter, I don't know why they should not have the right to do so. Suppose we go over to the grocery store and want to get something sweet to eat on our bread. They say, "We have maple syrup at one dollar a gallon." I say, "That is a little too much of a luxury for me; I will take New Orleans molasses at 35 cents a gallon." Now I have a perfect right to buy that for myself and family, if I prefer it to the maple syrup; but the dealer would not have a right to fill his jars labelled "Pure Maple Syrup" with New Orleans molasses and sell it to me for maple syrup. I don't just know how we are going to get out of this boat. We have been a good while getting into it. My impression is that there will be a law passed at some time when this oleomargarine will be sold for just what it is, with a brand placed upon it so the dealer cannot take it out of the package and say nothing about it, and give a man oleomargarine if he sees fit, and the man won't know whether it is butter or not.

In Massachusetts, it seems that they have passed a law there which has been confirmed by the Supreme Court, that they can compel those who manufacture and sell oleomargarine to sell it just as it comes from the—I don't know whether to say "churn" or "separator," or whatever it is they make it in. It is white, so that anybody can tell it from butter, although we have some white butter. They color it; and there is where the counterfeiting comes in. They make it to imitate a pure article. If I had a piece of metal that was just the shape and size of a silver dollar, and I would stamp on the face of it "counterfeit," I don't believe I would think of offering it for a silver dollar, and you wouldn't take it for a silver dollar either. But if it has all the stamp, device and pictures of the silver dollar it might easily be palmed off for a dollar. That is just the case with the oleomargarine, whenever they make it to look like butter. There are so many people who buy these things who don't stop to investigate. I venture to say that John McClintock is not afraid of his customers buying oleomargarine.

Mr. McClintock. Well, they do.

Mr. Holmes. I am sorry you said that. I have pitched in and helped you out of a good many scrapes. I guess McClintock isn't always reliable.

Now, it looks to me as if there is only one way out of the woods. That is to compel the manufacturers of that article to sell it for what it is worth; and then it looks to me as though we would have to keep on improving and making a better quality of butter.

Some speaker yesterday (I guess it was Wales), suggested that all those who handled dairy products should be prohibited from using tobacco and whiskey. I guess he thought of me when he said that. There seems to be an inclination to make better butter and cheese. Some one suggested (I don't know but what that was Wales, too), that when any person went into the manufacture of cheese and butter that he pass an examination like our teachers do, at the hands of the county superintendent of schools. I believe that would be a good thing, and it would result in the survival of the fittest. I can see no other way.

I guess that is about all. I can think of a little more to say, but I am so bashful I cannot say it. Much obliged to you for your attention.

President Crawford. The subject is now open for discussion.

A member. I would like to ask, if we pass these laws, how are we going to enforce them?

Mr. Holmes. I will try to answer that by relating a little anecdote. Once upon a time a sort of a club met, and they framed a resolution that each one should ask a question, and if no one could answer it they treated the questioner, and if the questioner asked a question that he himself could not answer, he was to treat the crowd. So the questioner for the evening asked: "How is it that the chipmunk can dig his hole in the ground and not leave any dirt on top of the ground?" They gave it up. They called upon him to answer, and he said: "He began at the other end." "How did he get there?" they asked. "Oh," he said, "that is a question of your own asking; you can answer it yourself." (Laughter.)

Mr. C. W. Heydrick. I think the gentleman, Mr. Holmes, struck the keynote in the last remark he made before closing his speech. It will be "the survival of the fittest." We have had some of the most unfit butter in this market that a man can conceive of. The result of a continued effort to force that upon the people here for consumption has resulted in the introduction of what seems to them, in their judgment, a better article. I may be excused, my fellow dairymen, for seeming to take the part of the oleomargarine. I don't wish to do that, but I believe in giving the devil his due. We have had such butter that we could not use it. We have been unable to obtain a better article, and if the dairy people have a better article

for sale, let them bring it in, and I will assure them that the people of Meadville, to the number of 200 families, will discontinue the use of oleomargarine and adopt butter in its place. They have found that the butter offered on the market and for sale in the groceries is unfit for human consumption, and they have been induced to take oleomargarine, believing it to be cleaner, purer, and a more wholesome article of food than that which has been offered in the market. I have been, myself, driven to the use of oleomargarine. I have had butter that we could not use, and I was ashamed to place it on my table. I have tasted oleomargarine in comparison with the finest samples of dairy butter, and it almost defied the best judges to tell which was which.

Now this case was brought to my notice before the State Board of Agriculture. I guess Secretary Edge will remember the circumstances. Several samples of butter and oleo were placed on exhibition, and the members of the State Board of Agriculture were requested to examine it, and express their opinion as to which was butter and which was oleomargarine, and I couldn't see that any one of the Board was sure in his own mind which was butter and which was oleomargarine. Now, if we cannot make butter fit to use, and if the people who can make oleomargarine can make it so that it is fit to use, and you cannot distinguish it from butter by the most careful tests, it certainly is a case of the survival of the fittest, and bad butter will have to take a back seat. I can assure you that some of the best families in this town are using oleomargarine to-day. It is because they cannot get good butter.

Mr. Crooker. There is no doubt but what there is poor butter made, but it kind of strikes me that right here in Meadville the people don't want good butter, especially when one man who lives near this city and took the first premium on butter at the World's Fair has to send his butter to Pittsburgh to get a market for it. It seems to me that there is something wrong either with the people of Meadville or with McClintock. You have a man that is getting 35 cents the year around for his butter in Pittsburgh. Why don't you stop that butter from going to Pittsburgh? Is it because these people don't like to deal with him? Would he rather deal with the people in Pittsburgh and ship his butter clear there? There must be something wrong somewhere. Our brother Heydrick here, is making a good deal of butter. Where does he market his butter?

Mr. Heydrick. I make good butter, but I send it where I can get the best price for it.

Mr. Crooker. Then it is not because the good butter is not made, but because the people of Meadville won't pay the price for it. You send yours away, and because you don't get as good quality here for a less price, you kick on the butter.

Mr. Heydrick. If I want a pound of butter, good butter, I go to McClintock and ask him for it, and he says, "I can't sell you butter by the pound." Some dairymen have come to me and said, "I don't even eat my own butter; I buy cheaper butter for my own use." How are we to get it if we want a pound of butter? We don't want to buy the whole lot of butter in order to get a pound. Last year I bought one of the packages that were left here. If it had been summer, though, I could not have kept it, for it was larger than I needed. I want the people in the country around here to make a better quality of butter.

Mr. Crooker. The point I wish to make is this—if these 200 families want good butter and are willing to pay for it what they pay in other places, they can have it, and some of the groceries would be glad to keep it. If they are willing to pay 35 or 40 cents the year 'round, some grocery here will keep it. The trouble is we are all trying to buy as cheaply as we can, and are not willing to pay for the best quality. We want some one to bring in as good butter as we send away and give it to us at a cheaper price than we sell for.

Mr. McClintock. That is just the trouble. That very sample of butter that I sold to Heydrick last winter, he wasn't willing to pay the full value of the butter. We make a number one article of butter that commands a first-class price to-day, and if Heydrick will guarantee me enough patronage to take my butter supply the year 'round I will agree to furnish them the butter. I will not charge them over 30 cents a pound, and furnish it every week. They must take a certain amount of butter every week, and take it whether they use it or not. If the grocery stores would form a combination and say, "we won't buy only a certain standard of butter," and they get down to a certain standard and pay according to the quality of the butter, just what it is worth, and sell it on that plan, I will guarantee that you won't have any poor butter on your market. A pound of good butter is cheaper at 50 cents than oleomargarine or poor butter at 15 cents. He said you couldn't tell the difference. One requires a higher heat to melt it than the other, 10 to 20 degrees difference. If you put the two into a small basin and melt them, the pure butter will melt at from 15 to 20 degrees quicker than the other.

Mr. Phelps. I hardly think Mr. Heydrick's logic is good in regard to the price of butter. I have sold butter, and sold it to private families. Yesterday I called in at quite a large grocery store to see what the prospects were for selling butter. I asked what he could pay for good butter. He asked me if I had any to sell, and I said "yes." I said, "I have not sold for less than 25 cents. It is all printed butter." He said, "I cannot pay that for butter here, because I cannot sell it." That refutes Brother Heydrick's argument right

straight off. The people will buy the cheaper brand all the way down. That is where the oleomargarine comes in. We are making good butter to-day, but we cannot get our price for it. We must come down to this low grade butter. Two cents a pound will change a man's purchase. Sometimes I think they prefer the poor butter. He cannot buy butter here and pay 25 cents for it because he cannot sell it. That is just the reason. There are butter makers all around you that would be glad to sell good butter for 25 cents, and will take a contract to do it. I mean good butter. It may not score 97 or 98, but it will be good, No. 1 butter. You recall what Gurler said, "No man need be ashamed of his butter if it scores 90, but there are some little points that it lacks." People won't buy good butter because they are looking for something cheaper.

In regard to the using of oleo. I claim that it is not healthful. Any butter that won't melt in your stomach at a normal temperature is not healthful. The oleo melts at 106, and butter will melt at 76 to 86. Normal temperature is 98. Good butter is digestible; the other is not. Oleo is composed mainly of stearine and palmatine. There is a difference.

Mr. G. H. St. John. I am willing to pay 25 or 30 cents for good butter rather than to have poorer butter at a lower price. I have been trying to get butter that is wholesome and fit to eat, and I have bought not less than 50 pounds at a time, and I am willing to pay the man just what he asks for it; but where is your butter? We cannot get it when we want it. There are two sides to this.

Mr. Phelps. I will go and interview you.

Mrs. McDowell. I have been thinking for sometime that there must be something really wrong with the men, for Brother Phelps is the first one I have heard say that oleomargarine is not healthful. I have kept in mind the indigestibility of this oleomargarine. It has been said here that people have a right to eat what they please. We have no right to supply our bodies with impure food, and we as fathers and mothers of the coming generation have no right to put impure food on our tables or into our stomachs, and we have no right to give it to our little ones, and the laws of our land should be so framed and enforced that they will put everything away that would injure our children. When I see the men are a little off in this direction, it is my duty to inform them of it. According to scientific tests oleomargarine is an impure food, and as many times as I have heard the men argue on this subject I have never heard them speak of the injurious effects of oleomargarine until Brother Phelps spoke of it. Go to some scientific man who understands this business and ask him if it is fit for our tables and for our children.

Mr. A. J. Palm. I am not much of a dairyman, but this is a question that concerns everybody. It is not a question of whether we can

get good butter or no butter at all. It is simply a question as to whether a man has any rights that the law is bound to respect. Have I a right to make a wholesome product that somebody wants and is willing to buy, or have I not? If I have not, then the Constitution is not right; it is a misnomer. They say this oleo is unhealthful and ought to be prohibited on the grounds of it being injurious. In regard to its unhealthfulness. It does not melt, they say, when you put it in your mouth. If you can take it in your mouth and it doesn't melt, you are certainly a colder blooded person than I am. I say it is a question of principle. Now about 30 cents butter. A man has to buy butter and cloth and everything else, in proportion to his money. I cannot afford 40 cent butter, and if I want to buy oleomargarine and eat it for what it is, I am going to do that. The best chemists in the United States say it is not unhealthful. Your chairman said there were 70,000,000 pounds of oleo used in this country last year. Just one case of injury resulted from it that we have reported. One hotel in this town uses 300 pounds every month.

Here is what Dr. Cyrus Edson, chairman of the New York city board of health, says of it after thoroughly investigating the whole process of the manufacture of butterine in the Armour factory: "We cheerfully testify that we consider it a palatable, cleanly and wholesome food product."

The three eminent chemists who acted as judges at the World's Fair, Prof. Sharpless, of the Boston School of Technology; Prof. Atwater, government experimental chemist, and Prof. Wiley, chief government chemist, refused to recognize many so-called food products, but after a careful analysis of butterine awarded a medal for what they called "a sweet and wholesome product called butterine."

Prof. Charles F. Chandler, of Columbus College, New York, says: "All the great chemists of this country have pronounced in favor of artificial butter. When I was president of the health board of this city I investigated oleomargarine and butterine very carefully, and would have stopped their manufacture at once had I not found that they were perfectly wholesome. On the contrary, I found them much better than the cheap butter which was sold in most places, and which became rancid in a very short time."

Prof. George F. Baker, of the University of Pennsylvania, says: "I have been acquainted for several years with the discovery for producing butterine from oleomargarine fat. The process of manufacture, as I have witnessed it, is conducted with great care and cleanliness. The butterine produced is pure and of excellent quality, is perfectly wholesome and is desirable as an article of food."

Prof. Henry Morton, of the Stevens' Institute of Technology, New Jersey: "It contains nothing whatever which is injurious as an

article of diet, but, on the contrary, is identically essential with the best fresh butter."

Prof. W. O. Atwater, Wesleyan University, Connecticut: "It contains essentially the same ingredients as natural butter from cows' milk. Butterine is perfectly wholesome and healthful, and has a high nutritious value.

Prof. J. W. S. Arnold, medical department, University of New York: "I consider that each and every article employed in the manufacture of oleomargarine or butterine is perfectly pure and wholesome; that oleomargarine butter differs in no essential manner from butter made from cream. In my opinion oleo is to be considered a great discovery, a blessing for the poor and in every way a perfectly pure, wholesome and palatable article of food."

Prof. S. W. Johnson, Yale College, says: "It is a product that is entirely attractive and wholesome as an article of food, and one that is for all ordinary culinary and nutritive purposes the full equivalent of good butter made from cream."

Prof. Charles P. Williams, analytical chemist, Philadelphia, says: "It is a pure and wholesome article of food, and in this respect as well as in respect to its chemical composition, fully the equivalent of good dairy butter."

From the Scientific American: "Oleomargarine is as much a farm product as beef or butter, and is as wholesome as either."

Dr. E. H. Flint, health officer of Erie, Pa., under date of February 1, 1895, says: "Regarding the comparative merits of butter and butterine as articles of food, I must say that from various samples of the two articles which have been examined in this office, I find that in many instances the butterine is superior to the butter, and I consider it a perfectly wholesome article of food."

Mr. McClintock. Let me interrupt you. You are talking about butterine. We were talking about oleomargarine.

Mr. Palm. They are the same thing.

Mr. McClintock. No; they are not the same thing. Butterine is composed partly of butter, of pure butter. Our law doesn't say anything about butterine.

Mr. Palm. Seventy million pounds were sold last year, and those 70,000,000 pounds were used by people, largely, who could not afford to use or to buy any other kind of butter. If it had been shown that it had reduced the price of butter there would be more sense in the argument, but butter has a better price than almost any other product.

A Member. Can't these hotels down here afford to use good butter?

Mr. Palm. The guests of the hotel keeper I refer to prefer the oleo.

Prof. Waters. The gentleman who has been arguing on the side of oleomargarine said there was 300 pounds of this oleomargarine used in one month in one hotel in this town. Suppose I go to that hotel and register as a guest and sit down at the table, and after eating the dish of oleomargarine that has been furnished me, I say to the waiter, "A little more butter, please." The waiter does not say, "We have no butter," but without saying a word goes to the pantry and fills my dish with oleomargarine and serves it. I am paying for butter, and pay 50 cents for the meal, and they feed me on oleomargarine and call it butter. I am paying them for butter and they are serving me with oleomargarine, and I say they have no right to do that; no more right than if I went into a restaurant and ordered beef and they served me with horse meat. They are serving horse meat in Philadelphia and New York, and it would be perfectly absurd to object to any laws or any efforts to prevent the dealers from selling horse meat when a man goes in and orders beef. I have no objection to this article we are discussing being sold as oleomargarine, but I have serious objections to buying butter and being furnished with oleomargarine in its place. That is the only objection I have to it.

Mr. Palm. We agree exactly, but if you were eating butter and you sent back your dish for more butter, and you couldn't tell the difference, how would you have the law enforced?

Prof. Waters. I don't know. I am not posted on this question myself. As was suggested by the chemist, Dr. Montgomery, this matter should be controlled so as to prevent the adulteration of food.

Mr. Dempsey. For the benefit of some who may not know, I will say that I am from Ohio. We have in Ohio, we think, as good a law as can be made on this subject. We do not deny the right of a man to eat oleo if he wants it, but we do claim he has a right to know what he is eating. Our law compels a man to brand it as oleomargarine. If a hotel uses oleomargarine on the tables, they have to place upon their walls in letters not less than three inches long, "Oleomargarine used here." I know then what I am eating and there is no fraud perpetrated. The Supreme Court has decided that our law is legal and constitutional. We enforced that law through the State Food Commissioner. When we catch an offender we fine him severely for food adulteration of any kind. We will force butterine and oleomargarine out of the market. At the present time it has a place upon the market, and it remains there simply on account of the quality of much of the butter made in the country. We all know that the average farmer's butter is an inferior article. The material is all right but it is not properly prepared. They will have to educate the farmers up to making good butter. We are gradually

coming to that, and eventually we will all know how to make good butter, and then oleomargarine will have to take a back seat. Another thing I want to say—you have made it possible for oleomargarine to be sold as butter by the use of butter coloring. I claim that the man who colors his butter is as great a fraud as the man who makes oleomargarine. I claim that the only honest way to color butter is through the cow. If a man feeds the proper food to a cow he will have all the butter coloring that is necessary.

Mr. Phelps. This is an interesting and very important question to the dairymen of Pennsylvania. On the decision of this question rests the success or downfall of the dairy industry, and it is a mighty good thing to solve it right here now. It seems to me that the gentleman's argument in regard to coloring is an argument in favor of the Jersey cow. I understand that he is closely identified with the Jersey cattle business. Now, in regard to the coloring of butter, I ask, "Does it change the quality of the butter?" No, it does not change the quality of the butter. What do we color it for? Nothing more or less than to please the eye. The coloring is not deleterious to the butter. We only put that coloring in there to please the eye. It is not against the law. Pass it around the table with butter that is not colored and every man will take of the colored butter rather than the other. It is to please the eye and nothing else. Just as we put it up in a nice package—it doesn't affect the goods any, but it does please the eye of the customer. We may sit down to the table and have the same kind of things to eat, and if it is not put up in good form we don't want it. No difference at all in regard to the effect the food has on our system, but we want something that looks nice. You color oleo to deceive, and that is just where the Supreme Court based its decision. It was to deceive the people. You go out to an apple tree next fall and take a Baldwin apple that has grown on the outside of the tree, and you will find it red; those that grow on the inside are green. The buyer comes to your place and he will tell you that he will give you twelve cents a bushel more if the apples were red. The buyer buys quicker on account of the color. What is the difference? Just to please the eye. Mr. Palm has read to you lots of certificates from professors and chemists to show you the healthfulness of this product. I have noticed that sometimes men high in their professions stick pretty close to Armour in answering these questions. I have a little article from the Wisconsin Experiment Station which I will read. It is as follows: "It is a favorite saying with the advocates of oleomargarine that it is just as digestible and wholesome as butter. This is not true, and in the nature of things cannot be true. First, as to its digestibility. Butter melts in the human stomach at 89.6 degrees to 91.49 degrees, and passes readily into pancreatic emulsion and digestion. As will be seen,

this is at a point below the natural heat of the human body. There is no gastric or nervous strain necessary to expel it from the stomach, for it is a substance designed by nature for food in its own unchanged state. Oleomargarine melts at 105 degrees to 108.32 degrees. The heat of the human body is not sufficient to emulsify it and it remains a dead, inert substance, and causes severe nervous tension and a forced gastric action to expel it from the stomach. This fact alone will show that it is not as digestible as butter. Besides, it is not wholesome. Invariably butter advertises its own condition. No man or woman need be deceived thereby. Any admixture of deleterious elements is told at once in a loss of flavor. It is composed of what are known as the basic facts, stearine, oleine, palmatine and a number of other delicate flavoring oils, all highly conducive to digestion. Oleomargarine is composed of stearine and palmatine, mainly, and in a condition unfit for digestion. It is rendered at a low temperature, not above 120 degrees Fahrenheit, and any man ought to know it is not enough to destroy any germs of disease or infection which quite naturally might come to it from the slaughter house surroundings. We admonish people to cook their ham and pork most thoroughly, to avoid the danger of trichinae and other diseases. Such cooking subjects the meat to from 212 to 350 degrees of heat, yet we are told that oleomargarine is wholesome, coming from the same derivation and rendered at a temperature that little more than warms it.—Hoards Dairyman."

This comes from the highest source. That does not sound as though it was very wholesome. When doctors disagree where are you going for information? We needn't go to the doctors. If we know that the heat of the human body is not sufficient to melt this product, how are we going to digest it? If it does not melt under a less heat than 108 degrees, and the heat of the human body is only 98 degrees, I would like to know how we are going to digest it?

Mr. Palm. Did you ever put any of it in your mouth to see if it would melt?

Mr. Phelps. No.

Mr. Palm. Well, if I put a piece of butter in my mouth and it melts I have horse sense enough to know it, and if I put a piece of oleo in my mouth and it melts, I have horse sense enough to know that.

Mr. Phelps. I presume that Palm has been trying a high grade of oleomargarine or butterine, composed of three-fourths butter, and therefore he has condemned the cheaper grade of butter. He is basing his statement from a high grade on the low grade of butter. There is another point. We have a great deal of sympathy for the poor man who cannot afford to buy the high grade of butter. As the president said, this oleo costs about six cents a pound to make

it, and the manufacturer sells it for fifteen cents, and the poor man pays the difference. Now, if that is the case, why doesn't the poor man go and buy the fat and make the oleo? Is it against the law? Is it against the law for a man to eat his grease, tallow and lard? I presume the oleo Mr. Palm speaks of has a certain amount of fat and tallow. If it is to the poor man's benefit to have this article, why does he go to Chicago and have it shipped and pay 15 cents a pound for it?

Mr. Palm. It cannot be sold for what it is worth. A gentleman from New Castle said he had sold tons of it at 26 cents a pound, and he could have sold it for 19 cents and made a big profit, but he had to sell it as butter.

Mr. Phelps. I think the only way to get at this thing right is through the coloring. I don't endorse the Ohio law at all. If people want to eat butter with coloring in it I am willing, but I want a man to eat what he pays for and I want him to know exactly what it is. I have ciphered this thing out and I don't know any way that you can make oleo sell for oleo but to make it sell for just what it is on the test of coloring. Then every man will know just what it is.

Secretary Edge. This is a question that I do not like to talk about. The man who wants pure butter has a right to have it, and the man who wants oleo has an equally good right to have that. That is the whole problem. Now, the fact is there is a bill before the Legislature at Harrisburg that our dairymen do not seem to know anything about or to appreciate the fact. There are three bills before the committee—one for the repeal of the oleomargarine law, one to brand the article made and one to license its sale. I am in favor of the law to compel the manufacturers to brand it. I would urge upon you the necessity of taking action at once, and notify your members at Harrisburg what your desires are in regard to the passage of this bill. I want to impress upon you the necessity of corresponding with your members and let them know what you want.

A Member. It is just as big a fraud to color butter as to make oleomargarine the color of good, honest butter.

Mr. Magaw. This subject of oleomargarine was brought up before this Dairymen's Association ten or twelve years ago, and we undertook to crush it out at once. There was a man here from the state of New York, and he had been through the oil region and had seen more or less of it. He said that it was made from sick horses and hogs. He said, "We are going to knock the whole thing in the head; it interferes with our business." It is only a few weeks ago that I traveled through England, and in every city I found shops where the sale of oleomargarine was carried on to a wonderful extent, and sold at a sixpence a pound. You would have been surprised to see the people go to those establishments with their

marble counters and neat clerks, and see those waiters deal out this product at 12 cents a pound. It is wonderful the amount that there is sold there. One gentleman has 32 establishments. I inquired where they made it. He said, "Not far off." I tasted the butter and was very much pleased with it. It will always be made. I am not afraid of it. I would prefer butter made from cream, and always will. The best butter is made from cream and cannot be made from anything else. The oleomargarine is good, and I believe it is not unhealthful. I would rather eat it than lots of the butter made within ten miles of Meadville, but I believe it should be sold for what it is. There is where I think some action should be taken; also on the matter of filled cheese. There are tons and tons of filled cheese made in western states. They buy it for five and one-half or six cents a pound. The first thing you know I will start a factory of that kind myself. They take skim milk and make a cheese that has to be sold at once. I think the Association should appoint a committee to draw up resolutions and present to the Legislature and compel the parties that make that kind of butter to brand it for what it is.

Mr. McLaughlin. You have put me on the committee on resolutions. These resolutions have been drafted, and the committee was unanimous in reporting in regard to these resolutions asking members of the Legislature to support the old law and not allow that law to be repealed. It has grown on my mind that the old law was wrong; that we were compelling people to pay for oleomargarine as a substitute for butter twice what they ought to pay for it. What are we to say to the Legislature? Shall we say to them give us a new law, or stand by the old one? There are a good many objections in my mind in regard to the old one. Brother Phelps introduces the argument that it was deleterious to health. He says it is made of lard and tallow, and it will not digest. He has tried his horse sense on it and he says it will not digest. I have hardly ever gone to the meat shop to buy a nice piece of beefsteak, without saying, "Please put in a little suet." You know the suet adds a flavor that butter does not add. If they make oleomargarine of these ingredients it will certainly digest. And if that is a fact your objection has gone to the wall. We have eaten pork for years, and we will continue to eat it, and other generations will follow our example and not die from the ill effects of it. Our action here will be watched by the newspapers. Mr. Palm will publish it; Mr. Cutshall will publish it, and our action will go to the members of the Legislature. What is best for us to do? You can not drive it out. I hold a copy of the law here that has been introduced. It seems as though they are trying to pull the wool over our eyes, but we don't want it that way.

Mr. Edge. I don't know whether farmers understand the amount of adulteration of food that is being carried on. I believe I can go into New York and truthfully say that all the buckwheat hulls go to the spice mills. A man who adds coloring to his butter is just as much of a fraud as the man who makes oleomargarine.

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Prof. Waters. I would like to say a word about this matter of separators. Careful laboratory tests have been made of some of the separators, and the results have been published in bulletins and agricultural papers, and when they make the charge that the mouths of the teachers of the State College have been closed, it is not a fair statement. I declined, myself, to answer the question as to which was the best separator, just as I would decline to answer which was the best binder. There are certain points that come into the handling of a separator that one man may have and another man may not have, and opinions might differ because of the different way of handling the same separator, and for that reason the Experiment Stations have made these tests carefully and reported the results, and then every dairyman may draw his own conclusions, because they cannot make a test of each man's convenience for handling these machines. So I think the Experiment Stations and the Dairy Schools are not in the least deserving of censure in this matter, because they have given the dairyman the result of the most careful tests, and allow him to judge of the merits of the different machines, taking into consideration his own personal conveniences for handling the machine.

Mr. Lavery. I want to add a word about the Experiment Station tests. I have had some experience in running separators, and can say that the efficiency of the machine depends largely upon who runs it. There are no poor separators put upon the market—I might perhaps make one exception. There is one that I do not approve of, but all the rest will do good work if properly run. That is all there is of it. The Experiment Stations could not tell which was the best separator, because some man might go and do poor work with a good machine.

Mr. Lefever. The man we had this year from the Experiment Station would tell us if he knew. But the man we had last year said, in answer to the question, that he "wasn't here in the interest of any separator manufacturing company."

Mr. Rose, Cortland, O. I am interested in filled cheese more than in butter. I belong to Ohio. I have here a sample of filled cheese for you to inspect. It is being put on the market at about 6½ cents a

pound. It was marked "full cream cheese." Our interests are alike in these two states. You should take some interest in regard to filled cheese. This is a sample of what is being offered in every one-horse grocery, marked "New York full cream." A Wallington, O., gentleman said when he found a man who could make as good a cheese as that he would give him $100 a month.

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## AFTERNOON SESSOIN.

Report of committees.

Report of Auditing Committee received and placed on file.

Report of Nominating Committee received and placed on file.

Report of Committee on Resolutions, J. B. Phelps, chairman, received and placed on file.

President H. C. Crawford read letter from Henry F. James, Esq.

Report on butter test received and committee discharged.

Secretary G. H. St. John asked permission of the Association to have Dr. C. C. McLean prepare a paper on the tuberculin test, to be incorporated in the State report.

Dr. J. H. Montgomery would make tests proper of the samples of salt, at the college laboratory, and report added to the State report.

Mr. McClintock. I would like to say something about the National Dairy Congress. We, as a part of that Congress, have to furnish part of the funds to help pay the incidental expenses of that Association. Our allotment here would be $30.00; $20.00 from this Association, and $10.00 from the State College; which allows us three delegates, two from the State Association, and one from the State College. It is necessary that we should be represented in that National Dairy Congress if we intend to take a stand with other states in the dairy industry. We should have delegates down there to represent us. Hon. J. C. Sibley has kindly consented to represent us as a delegate. We thought we would take the cheapest plan to get a representative. We ought to furnish our quota to carry on that work; and I would like to put it before the Association and see if we cannot raise our share. It is very important to the dairy interests of our country today. I would say that every dairy state in the Union has a fund paid into that Association yearly. In Ohio they have formed a new association. It is hardly a year old, and they have nearly 1,000 members, with an annual fee of $1.00, and that gives them ample funds to carry on their association. We ought to subscribe every year to our Association. The benefit I get is worth ten times to me what the mem-

bership would be at a fee of $1.00 a year. I am willing to do all I can to help it on.

I would make this motion, that we make an assessment of some kind, and let the members come up and raise this $20.00 to hold our standing in that Association and to send men to represent us.

President. How shall this money be raised? By taking out of the Association funds or by contributions by the members?

Mr. McClintock. Prof. Waters said he would lay it before the State College. He said they would put up their quota.

Mr. Phelps. I would be in favor of making it a voluntary contribution by the members of the Association, from 10 cents to $1.00. We could soon raise $20.00 if we wanted to. I would rather do that right now.

President. No motion yet.

Mr. McClintock. I move that we raise this $20.00 by voluntary contribution.

Mr. Phelps. I second that motion.

Mr. Wise. Perhaps the Association does not wish to be recognized there.

President. Does this Association desire to be represented in the National Dairy Congress?

Mr. McClintock. I move that we be represented in the National Dairy Congress.

Motion carried.

President. All in favor of raising this $20.00 by voluntary contributions will signify by saying "aye."

Motion carried.

Mr. McClintock. I would suggest that the chairman appoint a committee for that.

President. I appoint McClintock to raise this money.

Mr. Phelps. Let the secretary prepare a paper, and the members come up and sign it and give what they will.

Mr. McClintock. This Association meets the 26th and 27th of this month. We will get the benefit of the best lecturers there are in the country.

Mr. McClintock. I move that we have Dr. Montgomery analyze these seven or eight different butter salts and have the result published in our State report, also in the Pennsylvania Farmer, for the benefit of our dairymen. I have the Diamond Crystal salt, but have not thoroughly tested it yet; and that is why I should like to have Dr. Montgomery make an analysis and see which is the best and purest salt that we can adopt.

Motion carried.

Report of Committee on Membership.

Adjourned.

## REPORT OF TREASURER.

M. G. Beatty, in account with the Pennsylvania State Dairymen's Association.

Meadville, Pa., February 6, 1895.

### Resources.

| | | |
|---|---|---|
| Balance January 31, 1894, | $372 63 | |
| Membership tickets, | 24 00 | |
| Butter sold at last session, | 4 50 | |
| State appropriation for 1894, | 350 00 | |
| | | $751 13 |

### Disbursements.

| | |
|---|---|
| W. W. Dean, for advertising, | $23 00 |
| G. H. St. John, postage, | 5 95 |
| E. J. Hall, photo of hall, | 1 50 |
| John Gould, lecture and expenses, | 15 00 |
| Mrs. Kate M. Busick, lecture and expenses, | 65 60 |
| Mrs. Helen Johnson, lecture and expenses, | 10 00 |
| W. H. Caldwell, lecture and expenses, | 18 89 |
| R. S. Hartley, lecture and expenses, | 3 07 |
| H. C. Crawford, lecture and expenses, | 2 15 |
| E. S. Crooker, lecture and expenses, | 1 20 |
| H. S. Mattison, lecture and expenses, | 69 00 |
| H. C. Adams, rent of hall, | 25 00 |
| G. H. St. John, freight, etc., | 2 56 |
| H. P. Gurler, lecture and expenses, | 18 89 |
| A. L. Wales, lecture and expenses, | 5 20 |
| G. H. St. John, salary, | 75 00 |
| P. J. McFarland, | 20 25 |
| R. L. Satterwhite, printing, | 18 50 |
| George Betts, music, | 15 00 |
| S. P. Bates, piano and rent, | 5 00 |

| | | |
|---|---|---|
| J. H. Montgomery, lecture, | 4 60 | |
| A. Bossaird, freight and drayage, | 11 06 | |
| | | 416 42 |
| Balance February 6, 1895, | | $334 71 |
| | | $715 13 |

Respectfully submitted,

M. G. BEATTY, Treasurer.

Approved:

E. S. CROOKER,

GEO. M. ORRIS,

Auditing Committee.

February 7, 1895.

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## REPORT OF COMMITTEE ON RESOLUTIONS.

Your committee report the following as adopted, after fair discussion:

Resolved, That this Association, appreciates the successful efforts of our State Printer, Clarence M. Busch, to place the State Agricultural Reports in our hands in time for distribution at our annual meeting.

Resolved, That this Association most heartily favors the publication and distribution of the results of the World's Fair Dairy Test.

Resolved, That this Association, appreciating the successful efforts of the Pennsylvania State College in the interest of dairymen, do earnestly call upon our State Legislature to appropriate the $100,000 asked for by that institution for the erection and equipment of proper buildings for the improvement and expansion of this work.

Further, That a copy of this resolution be sent to the Representatives in our State Legislature from Crawford, Erie, Venango and Warren counties.

The State Dairymen's Association hereby re-affirm all former declarations made on the subject of the manufacture and sale of oleomargarine, and continue to condemn the imitation of dairy or creamery butter by any compound or admixture which in any part of its composition, is injurious to health, and a palpable fraud on the innocent consumer; therefore, be it

Resolved, That we are opposed to any change of alteration in the act of 1885, prohibiting the manufacture and sale of oleomargarine within this Commonwealth; and we urge our Representatives in the

General Assembly to use their votes and influence to this end, and to secure an appropriation by the State to aid in a more rigid and effective execution of the law.

Resolved, That the course of our Representatives in Congress, Hon. J. C. Sibley, in his honest and manly defense of the interests of the people and the agricultural interest of the country, deserves and receives our hearty commendation.

J. B. PHELPS,
S. J. LOGAN,
L. T. McLAUGHLIN,
Committee.

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## REPORT OF COMMITTEE ON DAIRY UTENSILS AND BUTTER.

We have to report no new utensils on exhibition, but the Russian separator exhibited by P. M. Sharples, and the DeLaval, which stand at the head of machines of that class, were properly exhibited, and elicited much interest on the part of members present.

The butter exhibit is fair, but the temperature has been so low, that the consistency of the specimens is all the same, very solid. Our scores, made by the Committee, assisted by Prof. Waters, is as follows:

*Score of Butter exhibited at twenty-first annual meeting of the Pennsylvania State Dairymen's Association, February 6, 7 and 8, 1895.*

| Number. | Exhibitor. | Flavor. | Grain. | Color. | Salt. | Package. | Total. | Weight. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | *Lbs* |
| 1 | Thomas Patton, Hartstown, Pa. | 41 | 22 | 13¾ | 9 | 5 | 90 | 5 |
| 2 | A. P. White, Sheakleyville, Pa. | 41½ | 21½ | 15 | 9½ | 5 | 92½ | 1 |
| 3 | W. R. Fisk, Sheakleyville, Pa. | 41 | 21½ | 15 | 10 | 5 | 92½ | 5 |
| 4 | S. H. Dunn, Hadley, Pa. | 42½ | 22½ | 14 | 10 | 5 | 94 | 5 |
| 5 | W. A. Porter, Freehold, Pa. | 42 | 22 | 14½ | 10 | 5 | 93½ | 5 |
| 6 | W. A. Porter, Freehold, Pa. | 41 | 21½ | 14 | 8½ | 5 | 90 | 5 |
| 7 | R. S. Hartley, Freehold, Pa. | 41½ | 22½ | 14 | 10 | 5 | 93 | 1 |
| 8 | R. S. Hartley, Freehold, Pa. | 43 | 22 | 14½ | 10 | 5 | 94½ | 5 |
| 9 | D. E. Kelley, Miller's Station, Pa. | 41½ | 21½ | 14 | 9½ | 5 | 91½ | 5 |
| 10 | W. S. Wise, Meadville, Pa. | 45½ | 23½ | 14 | 8 | 5 | 94 | 5 |
| 11 | W. S. Wise, Meadville, Pa. | 43½ | 23½ | 14 | 9 | 5 | 95 | 5 |
| 12 | J. W. Heald, Conneauttville, Pa. | 40 | 20 | 12 | 8½ | 5 | 85½ | 1 |
| 13 | J. W. Heald, Conneauttville, Pa. | 40 | 21 | 12 | 8½ | 5 | 86½ | 1 |
| 14 | J. W. Heald, Conneauttville, Pa. | 40 | 20 | 12½ | 8½ | 5 | 86 | 5 |
| 15 | J. W. Heald, Conneauttville, Pa. | 40 | 20 | 12½ | 9 | 5 | 86½ | 5 |
| 16 | W. J. Cooley, Meadville, Pa. | 43 | 23½ | 14 | 9½ | 5 | 95 | 5 |
| 17 | C. B. McDowell, Dicksonburg, Pa. | 41 | 22 | 14 | 9 | 5 | 91 | 5 |
| 18 | C. B. McDowell, Dicksonburg, Pa. | 41 | 22 | 14 | 9 | 5 | 91 | 1 |
| 19 | T. T. Root, Cambridge, Pa. | 41 | 21½ | 14 | 9 | 5 | 90½ | 1 |
| 20 | W. A. Rice, Mecca, Ohio. | 38 | 22 | 15½ | 9 | 5 | 87½ | 1 |
| 21 | W. Dart, Hayfield, Pa. | 35 | 21 | 13 | 9 | 5 | 83 | 1 |
| 22 | H. D. Trace, Meadville, Pa. | 39 | 22 | 14½ | 9 | 5 | 89½ | 1 |
| 23 | E. V. Lefever, Hayfield, Pa. | 40½ | 21 | 12½ | 10 | 5 | 89 | 1 |

JOHN C. McCLINTOCK,
D. H. LEFEVER,
ARCHIE BILLINGS,
Committee.

## REPORT OF MEMBERSHIP COMMITTEE.

Your committee would respectfully report that owing to the severe weather and storm, the attendance of those not already members has been meagre; consequently, the new names added are not numerous.

The following are the names of new members:

Mrs. Thomas Patton, Hartstown, Pa.
A. P. White, Sheakleyville, Pa.
W. R. Fisk, Sheakleyville, Pa.
S. H. Dunn, Hadley, Pa.
J. C. Ames, Cambridge, Pa.
E. W. McArthur, Meadville, Pa.
Prof. H. J. Waters, State College, Pa.
Lewis H. Boyles, Meadville, Pa.
James A. Heydrick, Carlton, Pa.
Phillip Groel, Meadville, Pa.
R. J. Weld, Sugar Grove, Pa.

Respectfully submitted,

J. C. WHITEHILL,
C. A. STRANAHAN,
BENJ. CULP,
Committee.

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